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ORIGINAL ARTICLES.

REPORT OF SEVEN CASES OF RUPTURE OF THE URINARY BLADDER, WITH OBSERVATIONS ON DIAGNOSIS.[1]

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OF the following cases, I myself saw the first three and assisted in their treatment. I am indebted for the privilege of reporting these three to Drs. T. J. Conley, Bayard Holmes, and C. W. Earle, in whose hospital or private practices they occurred. Dr. Henry F. Lewis furnished me with the facts concerning Case IV, and Dr. Ludvig Hektoen, with those of Case VII. Cases V and VI occurred in the Cook County Hospital service of Dr. W. F. Knoll, by whom the histories were kindly placed at my disposal. I desire to thank all these gentlemen for their courtesy in thus enabling me to get together these interesting cases.

CASE I. *Traumatic rupture of the bladder; peritonitis; celiotomy; death.*—John D., aged twenty-eight, a well-developed, muscular man, was admitted to Cook County Hospital on the afternoon of May 31, 1889, in the service of Dr. T. J. Conley. He gave a clear, intelligent history of having been kicked in the supra-pubic region by a horse, twenty-four hours before. At that time he had not been intoxicated. He had urinated four hours before receiving the injury. Since then he had not passed a drop of urine himself, though a physician had withdrawn by catheter a "cupful of bloody water" five hours before the patient entered the ward. He complained of quite severe abdominal pain and of nausea. He was vomiting when admitted, the face was flushed, the skin not clammy, the mind clear. The breathing was rapid and almost entirely thoracic; the pulse 120, regular, quick, and the temperature 100° F. The abdomen was moderately tympanitic, the muscles tensely contracted, and there was an absence of hypogastric dulness. There was neither desire nor ability to expel urine. By the catheter a few drops of bloody fluid were obtained, and pressure over the abdomen forced out about a dram more. With the sound, no abnormal opening in the bladder could be discovered. Rectal examination revealed no fracture of the pelvic bones. Intra-peritoneal rupture of the bladder was diagnosticated, and as a confirmatory test 600 c.c. of boric acid solution were injected through the urethra, of which but 100 c.c. were recovered. Though previous to the introduction of the solution of boric acid, a Barnes dilator had been introduced into the rectum, no increase in dulness was noted in the hypogastrium, such as would have been found had the bladder held the fluid and been lifted against the anterior abdominal wall by the dilator.

Twenty-three hours after the reception of the injury, abdominal section was made and a linear rent in the posterior vesical wall near the fundus was repaired by suture. The parietal and visceral peritoneum showed injected vessels, loose adhesions, and an abundant flaky fibrinous exudate. Abdominal flushing and drainage were carried out.

Urine was voided voluntarily five hours after the operation, and again five hours later. During the remaining twelve hours of life no urine was obtained by voluntary micturition or by the catheter. Death followed at eight o'clock on the morning of June 1st, forty-nine hours after the injury, and twenty-four after the operation.

Immediately after death the abdominal wound was opened. The stitches in the bladder were almost concealed from view by the exudate covering the line of the wound. The bladder held without leakage a pint of water. There were general peritoneal adhesions, and there was a small amount of slightly fetid fluid in the lowest portion of the abdominal cavity.

CASE II. *Traumatic rupture of the bladder; celiotomy; septic peritonitis; death.*—(Service of Dr. Bayard Holmes, Cook County Hospital.) M. F., an adult male, on the morning of July 10, 1889, while intoxicated, fell a distance of twelve feet, striking on the feet and left hand, and cutting the chin. He immediately felt considerable pain in the abdomen, which grew steadily more severe. He evacuated both bladder and rectum an hour after the injury, but did not notice the character of the excreta. The patient was sent by the examining physician to the ward for minor surgery, where the wounds were attended to by the nurse. In the evening the interne, noticing a tense and tender abdomen and dulness in the hypogastric and left inguinal regions, inserted a catheter and drew off a pint and a half of dark bloody fluid, which flowed in quite a steady stream and coagulated soon after withdrawal. At 10 P.M., under ether, no pelvic fracture was detected. A sound passed by the urethra revealed a roughness in the fundus of the bladder. Celiotomy was performed, and a ragged rent, two inches in length, was discovered in the fundus, a little to the right of the median line, and just beyond the place of deflection of the peritoneum over the bladder. The lower half was sutured, and the margins of the anterior half were stitched to the

[1] Read at the meeting of the Pathological Section of the Chicago Academy of Sciences, December 1, 1892.

lower angle of the abdominal wound. A rubber drain was inserted into the bladder.

In spite of what seemed to be delirium tremens, and a general septic peritonitis (the latter confirmed by autopsy), the patient lived four and a half days after the operation.

CASE III. *Traumatic rupture of the bladder; peritonitis from catheter-infection; death.*—On the evening of May 18, 1890, there was brought to Dr. C. W. Earle's hospital for inebriates, a man who for several days had been drinking heavily. About ten o'clock on that evening, I saw him and had no suspicion of anything more than ordinary drunkenness. The next morning the nurse said the patient had complained of severe pain during the night, and had often gone to the closet to urinate. The man, who was now sobering up, could not remember when he had last urinated, though he said that during the night he had frequently felt the desire to empty the bladder. Suspecting retention of urine, I introduced a metal catheter (about No. 10, American), which passed readily, meeting no obstruction, and there escaped a dark, reddish fluid, containing, as shown by microscopic examination, a large number of red blood-corpuscles. The stream was an interrupted one, varying in the distance it was thrown from the catheter's end with the movements of respiration, and thrown, when the muscles of the abdominal wall were brought into play in the efforts of the patient to force out the fluid, for at least four or five inches. In this way, and by pressure upon the abdominal wall, something more than a quart of bloody fluid was withdrawn. There was dulness on percussion, now only faintly preceptible in the flanks, while before it had been noticeable near the median line, though before catheterization there had been no flatness on percussion made out, nor any rounded mass, such as the distended bladder gives rise to.

The history of the patient was valueless, as he remembered nothing of the events of the preceding days. The remains of a recent bruise were discovered on the right knee, and a friend reported that on the 17th a physician had been called, who prescribed for severe abdominal pain. No history of injury was obtainable. The temperature at the time of catheterization was 99° F., and the pulse 120. Rupture of the bladder was diagnosticated. A consultant advising against operation, the patient was put on stimulants, and kept quietly in bed.

The urine was frequently drawn by the nurse and always escaped when the patient brought the abdominal muscles into play, or when pressure was made over the abdomen, both of which actions caused no pain. The temperature never rose as high as 100° F. Gradual failure in strength occurred, and the patient died on the morning of May 21st, fifty-four hours after admission to the hospital and about four days after having been seen by the physician who prescribed for the severe abnominal pain.

A post-mortem examination was made twelve hours after death. The skull was not opened, and examination of the chest was negative. About one pint of clear, blood-tinged fluid was found free in the abdominal cavity. The visceral and parietal peritoneum presented a normal naked-eye appearance, except in the lower abdomen, where, in the most dependent position as the body lay on the back, *i. e.*, next the posterior wall of the abdomen, there were injection of vessels and a very few loose adhesions between the coils of the intestines, and a slight amount of fibrinous deposit. The posterior wall of the bladder showed a gaping wound, with irregular edges, extending from above downward and to the left, over two inches, and involving all the coats of the viscus. Other organs gave negative results, save that one kidney showed the changes incident to chronic interstitial nephritis.

CASE IV. *Extra peritoneal rupture of the bladder; abscess; death.*—The patient was admitted to Cook County Hospital moribund, with no history obtainable, save that he had been ill for several days with pain in the lower abdomen. He died in a few hours, no ante-mortem diagnosis having been made. The autopsy showed extra-peritoneal rupture of the bladder and localized suppuration.

CASE V. *Fracture of the pelvic bones; extra-peritoneal and intra-peritoneal rupture of the bladder; death.*—(Cook County Hospital, service of Dr. W. F. Knoll.) Maggie M., twenty-eight years old, fell thirty feet on January 13, 1891. Immediately brought to the ward, she was unconscious, breathing heavily and rapidly, bleeding from the ear, and with a feeble pulse. Three ounces of bloody urine were drawn by the catheter. But two-thirds of a solution of boric acid, injected into the bladder, could be recovered.

Incision over the arch of the pubis revealed laceration of the anterior wall of the bladder, and through this a laceration of the posterior wall could be diagnosticated. A comminuted fracture of the pubic bone gave a ready explanation of the damage to the bladder. Bloody fluid was extravasated into the pericystic cellular tissues and into the peritoneal cavity. The wounds were repaired, the patient taking the anesthetic poorly. She never regained consciousness and died on the evening of the same day. No autopsy was permitted.

CASE VI. *Extra-peritoneal rupture of the bladder; operation; death on the fifth day.*—(Cook County Hospital, service of Dr. Knoll.) M. K., an adult, painter, was admitted February 10, 1891. A mass of iron had struck him on the left groin and left side of the pelvis. On admission the general condition was good. There was swelling along the line of Poupart's ligament on the left side, from the root of the penis to a point two inches above the anterior superior spine. There was inability to urinate. One ounce of bloody fluid was withdrawn by the catheter. Injection of solution of a boric acid caused increase in size of the swelling, and none of the solution was recovered.

Incision in the median line, as in supra-pubic lithotomy, showed a fracture of the body and ramus of the os pubis, extravasation of bloody urine and boric solution. As the seat of the rupture was out of reach, a lateral perineal incision was made and a rent at neck of the bladder was discovered.

The patient lived for five days, with rapid pulse, averaging 130, and a temperature ranging from 99°

F. to 102° F. He complained of but little pain; the wounds were of a healthy appearance, the dressings always freely soaked with urine. On the morning of the fifth day a severe chill occurred, with rise in temperature, delirium, collapse, and death at 10.30 P.M. No autopsy was permitted.

CASE VII. *Traumatic intra-peritoneal rupture of the bladder complicated by uterine fibroids and cerebral hemorrhage; death after nine days; no peritonitis.*—A woman, thirty-five years old, suffering from severe pain in the head, was admitted to hospital on June 11, 1892. During the afternoon she had a fainting spell, and at about this time was kicked in the abdomen and beaten over the head with a broom by her drunken husband. On June 14th a physician found her suffering with severe headache and unable to answer questions. On the following night she walked about the room screaming, and on the 20th she died, without the development of any new symptoms.

The post-mortem examination, made twenty-four hours after death by Dr. Hektoen, who reports the case, showed no external mark of violence. The abdominal cavity contained three and one-half quarts of clear, limpid fluid with a urinous odor. The peritoneum was smooth, shining, and showed no evidence of peritonitis.

In the posterior wall of the urinary bladder, near the fundus, was a transverse tear, one and one-half inches long, with ragged margins free from any signs of inflammation, and showing on the mucous surface a few superficial continuations at the end of the total tear; the viscus was empty, the mucous membrane smooth, the walls apparently thin. The uterus contained three sub-serous fibro-myomata, the largest of a diameter of four inches, the pelvis being filled up. Heart, lung, kidneys, liver, spleen, showed no changes bearing upon this lesion.

In the left frontal lobe of the brain was a blood-clot, the size of a hen's egg, in a cavity lined with softened yellowish detritus. The pia mater in the longitudinal fissure was infiltrated with blood; the brain otherwise healthy.

REMARKS.—Out of a total of about eight thousand surgical cases in Cook County Hospital since 1889, five have been proved to be instances of traumatic rupture of the bladder. Two of the seven cases here reported were not diagnosticated before drath. This frequency of occurrence and failure to diagnosticate render it probable that the accident happens more frequently than is generally supposed. The *St. Bartholomew's Hospital Report* for 1869–75 mentions but two instances of injury to the bladder out of a total of 16,711 surgical cases.

The cases here recited are instructive, not so much from the point of treatment as from that of diagnosis. Incision and repair of the wound in intra-peritoneal rupture, and repair of the wound when possible, with drainage, in extra-peritoneal rupture, are probably regarded to-day as the rational treatment.

The history of a trauma can usually be obtained. If the patient himself, on account of intoxication, cannot remember an injury, bruise-marks can often be discovered, as in Case III, pointing to blows or falls. These may, however, be lacking, as in Case VII. In Case I, too, there was discovered only a slight area of subcutaneously extravasated blood when the abdominal incision was made. In rupture of the healthy bladder traumatism is to be assumed. When a weakness of the coats of the viscus exists, as from tuberculous or malignant disease, or from inflammatory changes in the wall of the bladder, or in its neighborhood, over-distention without trauma may cause rupture. Some, as Pousson, believe that an over-distended healthy bladder may rupture spontaneously. That drunkenness is an important etiologic factor is well known. It furnishes the abundant secretion of urine; a paretic, and consequently distended, bladder, which rises above the pelvic brim, where it is exposed to injury; and a relaxed abdominal wall, so that the force of any blow, to which a drunken man is especially liable, be it from a kick, a heavy weight, or a fall, comes with unchecked vigor upon the viscus with walls tightly stretched. In Case VII, as Dr. Hektoen points out, the enlarged uterus constituted a resisting body against which the bladder would be forced by the kick. A slighter blow might here suffice to cause rupture, and especially as the bladder, though not containing much urine, would be lifted by the uterus high in the pelvis.

Two of these seven cases occurred in intoxicated persons. In three, intoxication was not present. In one, the history in this respect is lacking. In Case VII rupture occurred probably some time after a cerebral hemorrhage, when the bladder can easily be assumed to be distended.

Drunkenness is not only an important element in etiology, but it tends to mask otherwise plainly-marked symptoms. The severe pain and the phenomena of shock, so commonly present, may, in an intoxicated person, be but slightly, if at all, marked. The inability to urinate in response to urgent desire, which condition is so characteristic of rupture in a person with unclouded intellect, is often overlooked in these cases by the patient, and, consequently, by the physician. When it is discovered the physician naturally passes the catheter and obtains no urine, or bloody urine.

I desire to call attention to one fact very strikingly illustrated by two of these cases. In Cases II and III there was a free discharge of fluid on the introduction of the catheter. In Case II, Dr. H. F. Lewis, who reports it,[1] says: "The catheter drew about a pint and a half of dark, bloody fluid, which flowed normally after withdrawing the point a short distance and re-introducing." In Case III, a quart

[1] The North American Practitioner, September, 1889.

of bloody fluid was withdrawn in a full stream, which, when the patient strained, was thrown four or five inches from the end of the catheter. The explanation of this occurrence seems to be that in both these cases the rent in the bladder wall, as was shown by ante-mortem and post-mortem examination, was so large that the catheter passed directly into the abdominal cavity, which contained the fluid. Pressure was made by voluntary contraction of the abdominal walls and diaphragm, just as is so often done by a patient when tapped for abdominal ascites. The diaphragm and abdominal muscles were readily made to contract, because at this time, at least in Case III, there was no peritonitis, causing the involuntary fixation of these muscles in order to avoid pain. This point, that when the rent is large, and especially when there is no peritonitis, bloody urine may be obtained in quantity and in a stream, seems worthy of careful consideration, as it is generally stated that no urine, or only a few drops of bloody urine, can be obtained by the catheter. Greig Smith, for instance, in his excellent article, says: "Only blood, or blood and urine, escapes in drops, and the patient gets no relief" (from catherterization).[1] The fact that in Case III the urine flowed, decided, at a consultation, against the diagnosis of rupture of the bladder, and hence against operation.

That peritonitis is not an inevitable consequence of rupture of the bladder is not only known by *à priori* reasoning, on the ground that aseptic urine will not produce peritonitis, and from well-known experiments, but is also clearly shown by these cases. Case III had no sign of peritonitis until he had been catheterized, and this by at least five different persons, and with poor or no antiseptic precautions. The autopsy showed commencing peritonitis in one place only, and that the most dependent portion of the abdominal cavity, when the patient was in the dorsal position, which he kept after the catheterization. Before that he had been up and down, and urine must have bathed all parts of the peritoneum; yet no peritoneal inflammation existed except where the infection by the catheter had taken place.

No case is more positive and instructive, however, than Case VII; here no catheterization had been performed, urine had accumulated in the abdominal cavity for nine days, and yet there was no peritonitis.

We can explain on no other ground than non-existence of early peritonitis the case of Harrison, in which the patient on the day after the rupture walked three miles to be catheterized, and kept at work three days more, emptying the bladder voluntarily. Only on the fourth day did symptoms of peritonitis develop, with death on the eighth day. There were local peritonitis and sac-formation by adhesions.[1] Gillespie reports a case in which, three days after the injury, a patient entered the hospital to be catheterized. Death occurred ten days later. The autopsy showed a ruptured bladder, intra-peritoneal extravasation of urine, and slight peritonitis.

The importance of being careful in catheterizing a patient with suspected damage to the bladder is emphasized by these cases. A septic catheter used for diagnosis may spoil the favorable result of a faultlessly aseptic celiotomy for the repair of the bladder-wound.

In four of these cases the injection of a solution of boric acid, with failure to recover a large part of the fluid injected, confirmed the diagnosis. The exploration of the hypogastrium in all these cases failed to reveal the physical signs of a distended bladder. When enough fluid is injected in this way the ordinary physical signs of abdominal ascites are obtained. In Case VI, the fluid escaping through an extra-peritoneal tear caused the swelling along Poupart's ligament to increase in size. Sterilized water would answer the mechanical purpose and avoid the risk of poisoning from retention and absorption of the boric-acid solution, and would not be as irritating to the sensitive peritoneal pericystic tissue. Keen[2] advocates, as an aid in establishing the diagnosis of intra-peritoneal rupture of the bladder, the introduction of sterilized air *per urethram*, after the analogy of the Senn rectal insufflation. This should give positive aid in extra peritoneal rupture, if there be swelling, tympanites on percussion, and the tissues be emphysematous on palpation. It might have the advantage, too, over the fluid, of escaping through small openings that were closed against fluid by a valve-like flap of membrane, inflammatory exudate, or hernial protrusion of intestine into the bladder.

The attempt has not been made to discuss at length the diagnosis of rupture of the bladder, but rather to give emphasis to some points that are exemplified by these cases.

The following conclusions seem warranted by the observation of the cases reported:

1. The absence of a history of a trauma or of external evidence of violence in the supra-pubic regions does not exclude traumatic rupture of the bladder.

2. When the rent is large, urine may escape from the catheter in a full stream.

3. When the rent is small and covered by free exudate, urine may likewise escape normally. (Ultzmann.)

4. Peritonitis does not necessarily follow rupture of the bladder.

[1] Abdominal Surgery, 4th ed., p. 752.

[1] Quoted by Ultzmann: Die Krankheiten der Harnblase, 1890, p. 70.

[2] Annals of Surgery, September, 1890.

5. This being so, in a suspected case extreme caution as to asepsis should be observed in catheterization.

6. As an aid in diagnosis the injection of a measured amount of warm sterilized water is in all cases to be tried, the abdomen subjected to careful physical examination before and after the injection, and the amount recovered by the catheter carefully noted. A Barnes dilator in the rectum will aid in lifting the bladder out of the pelvis against the abdominal wall.

7. Hydrogen gas or air may be substituted for water.

8. All injections should be under moderate pressure, as by high pressure an incomplete rupture might easily be converted into a complete one.

9. In all cases of fracture of the pelvic bones rupture of the bladder is to be sought, and *vice versa*, in all cases of rupture of the bladder examination per rectum, etc., must be made for fracture of the pelvis.

10. Extra-peritoneal rupture may be complicated by intra-peritoneal rupture. (See Case VI, in which apparently a spicule of bone made a through-and-through perforation.)

11. Supra-pubic cystotomy or opening of the abdominal cavity in suspected extra-peritoneal rupture is justifiable in order to confirm the diagnosis and to locate the point of rupture, so that drainage can be properly applied.[1]

SOME NOTES UPON URINALYSIS.

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IN the course of examining urines I have found that certain data, of which the analyst stands much in need, are not to be met with in any of the works upon urinalysis with which I am conversant, and I have examined, I think, all the manuals in general use. For instance, the average daily amount of total solids in the urine of healthy persons is given by all authors; but a statement as to what range of total solids is compatible with health is made by few, and then not in a satisfactory form. The average amount of solids is usually stated to be 70 grm. a day, but I am of the opinion that this is slightly too high for the average men and women in this country, and think 63 grm. would fall nearer the true average. The specific gravity in health may range from 1.015 to 1.025, the average being 1.020. The quantity of urine passed daily by healthy persons is said to vary from 1300 to 1500 c.c. The Haeser and Neubauer formula for estimating total solids from the specific gravity is sufficiently accurate for clinical purposes. This is executed by multiplying the last two figures of the specific gravity by the factor 2.33, the product of which represents the number of grams of solids in 1000 c.c. of the urine, and must be multiplied by the number of cubic centimeters of the urine under examination, and divided by 1000 in order to obtain the correct amount of solids. Taking this factor and the averages of specific gravity and quantity, we readily arrive at the following results for the health-range of total solids. Employing first the minimum specific gravity and maximum quantity, we have:

$$\frac{2.33 \times 15 \times 1500}{1000} = 52.43 \text{ grm. for the minimum solids.}$$

Using next the maximum specific gravity and minimum quantity, we have:

$$\frac{2.33 \times 25 \times 1200}{1000} = 69.90 \text{ grm. for the maximum solids.}$$

In calculating the maximum and minimum of total solids, I took as a basis the most usual conditions of healthy urine, *i. e.*, maximum quantity associated with minimum specific gravity and *vice versa*. But as there might be cases in which, along with apparent health, the maximum specific gravity is maintained simultaneously with maximum quantity, and *vice versa*, it seemed advisable to determine these widest possible limits of the health-range of total solids, as follows:

$$\frac{2.33 \times 15 \times 1200}{1000} = 41.94 \text{ grm.}$$

$$\frac{2.33 \times 25 \times 1500}{1000} = 87.38 \text{ grm.}[1]$$

In actual examination of urines it will be found that those whose total daily solids persistently approximate to either of these extreme figures represent some deviation from the normal standard of health. Whether a given case is pathologic or not must be determined by noting carefully all the conditions of the patient's environment; whether his diet is liberal or scanty; whether his habits are active or sedentary; the climate and season of the year, and, in addition, sex and weight are important factors in the problem. From my own experience I should say that the first determined limits, viz, from 52.43 to 69.90 grm., are much the safer ones to use in practice.

The ratio which the amount of urea in a sample of urine bears to the amount of total solids has seemed to me to be of some interest and value. Little is

[1] On the Value of Exploratory Laparotomy in Suspected Extra-peritoneal Rupture. *Vide* Cabot: Boston Med. and Surg. Journ., October 15, 1891.

[1] Note the concordance between the average amounts of solids as determined from each of these limits:

$52.43 + 69.90 \div 2 = 61.17$ grm.
$41.94 + 87.38 \div 2 = 64.66$ grm.

An average of these two amounts is 63.42 grm.

said concerning it in the manuals; but I have observed it in an extended series of experiments. It should first be remarked that all my figures are upon the basis of the whole twenty-four hours' urine, and all my examinations, with a few unavoidable exceptions, are made upon the total daily quantity. In estimating urea I use the hypobromite method exclusively, as being, upon the whole, the most satisfactory, and I make a fresh solution of hypobromite of sodium for each and every determination. I use the ureometer devised by Dr. Charles Doremus as the cheapest (for they will get broken), simplest, most readily cleaned, and, in general, the instrument best adapted for use in the physician's office; while at the same time I am confident that the ureometer of Dr. John Marshall is more scientific, more accurate, and better fitted for the use of the chemist. The daily amount of urea excreted in health may range from 20 to 40 grm., according to diet, the average of these figures being 30 grm. I am, however, very much inclined to think that 27 grm. daily is as high an average as the analyst will make in this country. Using our previously-calculated average limits for total solids, we find the limits of the ratio between urea and solids to be as follows:

$\frac{52.43}{20} = 2.6$, or a ratio of urea to solids as 1 : 2.6.

$\frac{69.90}{40} = 1.7$, or a ratio of urea to solids as 1 : 1.7.

Here I have employed minimum figures of solids and urea, and *vice versa*, as, of course, we almost invariably find them associated in nature. Taking minimum urea with maximum solids, and *vice versa*, as rarely occurs in health, and never persistently, the ratios will be as follows:[1]

$\frac{69.90}{20} = 3.5$, or a ratio of urea to solids as 1 : 3.5.

$\frac{52.43}{40} = 1.3$, or a ratio of urea to solids as 1 : 1.3.

From these two groups the average ratios will be calculated, as follows:

$2.6 + 1.7 = 4.3 \div 2 = 2.2$ or a ratio as 1 : 2.2

$3.5 + 1.3 = 4.8 \div 2 = 2.4$ or a ratio as 1 : 2.4

Hence we may conclude that the average ratio of urea to solids in healthy urine is as 1 : 2.3, but that there may be a range, dependent wholly upon diet, of from 1 : 1.5 to 1 : 3.0. And I should say from somewhat extended observation upon this point, both in normal and pathologic urines, that a urine in which the ratio of urea to solids remains persistently at either the maximum or minimum figure is not excreted by a person in thoroughly good health. As far as my experiments have gone, the most notable fact to be observed concerning this ratio in the urine of persons suffering from various diseased conditions is its extreme variability from day to day, in this respect differing markedly from the ratios in healthy urines. I should not at present attribute great diagnostic value to this ratio, but in every case I meet it furnishes valuable collateral evidence.[1]

The ordinary volumetric methods of estimating phosphates and chlorids, while they are accurate and not difficult of execution for one who has plenty of time at his disposal, are yet out of reach of the average practitioner of medicine. Yet he would many times profit by the knowledge of the approximate amount of these substances in his patient's urine; so that I have endeavored to improve upon the rough methods of estimation given by most authors. I have not yet proceeded far enough in my experiments to be certain of the value of the method I propose, but, every time that I have checked it by the volumetric methods, it has furnished results sufficiently accurate for the physician's purpose. It is to be borne in mind that the knowledge of the exact amount of chlorids and phosphates in a urine is of no practical value to the physician. If he knows whether these substances are present in increased or decreased quantity, he possesses all the knowledge that he can apply in the present state of our science. The method I use is not new, but I am not aware of its application to the estimation of these salts in urine, though I doubt not it may have been so employed. I venture a hope that some physicians may find the method serviceable.

The necessary reagents are: The same solution of silver nitrate that is used in the volumetric estimation of chlorids (though any dilute solution will answer); a solution of a chlorid (preferably NaCl) of such strength as to represent the average proportion of chlorids in normal urine; and a simi-

[1] Upon the basis of extreme limits of variation of solids the ratios might be figured as follows:

$\frac{41.94}{20} = 2.1$, or a ratio of urea to solids as 1 : 2.1.

$\frac{87.38}{40} = 2.2$, or a ratio of urea to solids, as 1 : 2.2.

The converse $\left(\frac{41.94}{40} = 1.05 \text{ and } \frac{87.38}{20} = 4.4\right)$ is impossible.

[1] For normal urine the following averages are those given in the books for the twenty-four hours' quantity:

Average specific gravity	1.020
" quantity	1350 c.c.
" total solids	70 grm.
" urea	30 "

From this we find an average ratio of urea to solids of 1 : 2.33 $\left(=\frac{70}{30}\right)$. As 63 grm. seems a better figure for average solids, and 27 grm. a more correct average for urea, the corrected ratio will be 1 : 2.3 $\left(=\frac{63}{27}\right)$.

And note that the average amount of total solids calculated from these very figures (quantity 1350 c.c. and specific gravity 1.020) differs from that stated in the table, as follows:

$$\frac{2.33 \times 20 \times 1350}{1000} = 63 \text{ grm.}$$

lar solution of a phosphate (preferably Na_2HPO_4).[1] One-half dozen ordinary stand test-tubes and a graduated pipette constitute the necessary apparatus. The principle of the method is the comparison of the relative bulk of the precipitates formed by adding the silver solution to the normal solutions, with similar precipitates formed by adding the silver solution to the urine. In estimating the chlorids I at present employ 1 c.c. of the sodium chlorid solution diluted to 5 c.c. in a stand-tube with distilled water, and 1 c.c. of the urine to be examined similarly diluted, to which is added one drop of nitric acid to prevent precipitation of the phosphates. Then 1 c.c. of the silver nitrate solution will completely precipitate the chlorid in the standard solution. Add silver solution to the diluted urine until the precipitate no longer forms, and shake both tubes thoroughly. In two or three minutes the comparison of the relative bulk of the precipitates may be made, and will give a fair estimation of the deviation from normal, if there is any, of the chlorids in the urine. This method is very easy of execution, the required solutions keep well, and it furnishes, so far as tested, fairly approximate results.

In roughly determining the phosphates I add 1 c.c. of the sodium phosphate solution to 1 c.c. of the sodium chlorid solution (as the chlorids and phosphates in the urine are necessarily precipitated together) and dilute to 5 c.c. with distilled water. As before, dilute 1 c.c. of urine to 5 c.c., and then add excess of silver solution to each tube, and shake. A mixed precipitate of silver chlorid and silver phosphate falls in each tube, and, as we already know the relative amount of chlorids in the urine, any change from that relation will denote the deviation in amount of phosphates from the normal. I am free to confess that the application of this method to the phosphates is not yet nearly so satisfactory as it is in the case of the chlorids.

Sometimes the analyst receives a sample of urine which is twenty-four hours old, or more, and it would be of great value to know approximately what changes, if any, had taken place in the urine since it was voided, either in specific gravity or amounts of urea and phosphates. The manuals furnish no information upon the point. I have only been able so far to try the effects of time upon the specific gravity and amount of urea, and then not in a sufficiently extended series of experiments to give authoritative results. Taking them for what they are worth, I note the following, and I select one case of each, rather than make an average. On a Sunday the specific gravity of a sample of fresh, warm urine (50 c.c.) was taken and found to be 1.018. When cold it read 1.022, and four days later it was 1.023. The evaporating surface was only three-fourths of an inch in diameter.

In a beaker, three inches in diameter, were placed 200 c.c. of fresh urine. An estimation of urea was made at once, and upon every succeeding day, for seven days. When fresh, the urea amounted to 0.020 grm. in 1 c.c., or 24 grm. in 1200 c.c. On the fourth day it was 0.022 grm. urea to 1 c.c., or 26.40 grm. in 1200 c.c.; and upon the seventh day, 0.0234 grm. in 1 c.c., or 28.08 in the 1200. On the last day the urine was brought to the original bulk by adding distilled water, and then the urea read 0.018 grm. in 1 c.c., or 21.6 grm. in 1200 c.c. The result shows an apparent gain due to evaporation of 4.08 grm. of urea, but a real loss of 2.4 grm. due to decomposition of the urea. It is worthy of note that I find little actual change, except by evaporation, if that is not prevented, in most urines during the first forty-eight hours.

These facts are not sufficiently borne in mind, for I have seen an insurance examiner many times take the specific gravity of a warm, freshly-voided sample of urine and report the result as representative, which it certainly was not.

[1] Formulas:

1. *Silver nitrate solution.*	2. *Chlorid solution.*	3. *Phosphate solution.*
$AgNO_3$ 7.265 grm.	NaCl 3.25 grm.	Na_2HPO_4 0.95 grm.
Water 250 c.c.	Water 337.5 c.c.	Water 337.5 c.c.

MASTOID ABSCESS.

By S. P. SCHROEDER, M.D.,
OF HOYLETON, ILL.

MASTOID inflammation is a complication of suppurative inflammation of the middle ear, but of such gravity and so serious that it might be called a separate disease.

Anatomically the mastoid process lies posterior and external to the petrous portion of the temporal bone. It is composed of cavities, in the healthy state intersected and subdivided by partitions. These cavities open into the tympanic cavity. In suppurative inflammation of the tympanic cavity the inflammatory process may extend into these cells, and once the pyogenic cocci have found entrance and lodgment in these caves, it is easily understood that it will be a hard fight on the part of the physician to get them out of their fortifications. On the inner and posterior side of the mastoid process is found the sigmoid groove, the continuation of the lateral sinus. This groove stands in danger of being injured when the mastoid process is opened.

The causes of suppurative inflammation of the middle ear may be summarized as follows: 1. Cold. 2. Injuries—(*a*) The forcible removal of foreign

bodies, chief of which is impacted cerumen. (*b*) The forcible injection of fluids. 3. The infectious diseases, among which scarlet fever takes first rank. The pathology of mastoid abscess is that of other bone-inflammation. There may be softening, sclerosis, caries, or necrosis.

The accidents, as they may be called, consist in the extension of the inflammatory process to neighboring parts, which occurs in two ways: (*a*) By extension along the vessels and natural openings, and (*b*) by forming a fistulous opening by caries through its bony walls. The inflammation may extend outward, inward, upward, downward, or forward.

When the inflammation extends *outward* it will show itself by edema, redness, and deep tenderness over the mastoid process, and the ear will stand farther from the head than its fellow. If left to open itself, the abscess is slow in its progress, and when it opens the pus is offensive in odor. If the inflammation extends *inward* it will be recognized by symptoms caused by phlebitis, thrombosis, and embolism of that portion of the cranial cavity that is drained by the lateral sinus and the superior and inferior petrosal sinuses. Hence there would be edema of the corresponding side of the face, mastoid prominence, and head, due to the obstructed return-circulation. There may be high fever and vomiting.

If the inflammation extend upward there will be symptoms due to meningitis, as for example, severe headache, not localized, restlessness, fever, vomiting, irregularity of pulse, coma, and death; while, if cerebral abscess should form, I take it the symptoms would be so obscure that they could not be differentiated from those of meningitis, and the diagnosis could only be positively made in the post-mortem room.

If the inflammation extend downward, the pus would gravitate into the retro-maxillary fossa, and from there downward along the cellular plains in connection with the great bloodvessels of the neck. If the inflammation extend forward, an abscess is formed on the posterior wall of the external auditory canal, which, after it opens, leaves a sinus, and from its external opening large granulations spring up resembling polypi.

I shall give the history of a case that had three of these accidents: Periosteal mastoid abscess, extension of the inflammation into the external auditory canal, and very probably cerebral abscess. It also shows the ravages of this affection:

CASE I.—In March, 1889, I was called to see J. McCairy, a farmer, and a native of Ireland, aged seventy years, remarkably stout for his age, who complained of pain in the left ear, which radiated over the corresponding side of the head and face. He had suffered from pain about five days. There was slight fever. Otoscopic inspection revealed a red zone around the attachment of the tympanic membrane, and a red line where the handle of the malleus was located. The membrane was bulging outward, and had lost its luster. There was deep tenderness of the mastoid process. I recommended paracentesis of the tympanic cavity. This he objected to. Two days afterward, however, the patient permitted me to incise the membrane. At this time, however, the external auditory canal was so swollen that it was well-nigh impossible to get a clear view of the membrana tympani. There was some edema over the mastoid prominence, and the ear stood farther from the head than its fellow. I warned him of the gravity of the case, which scared him, and the next I knew he was attended by another physician. After four weeks I was called to take charge of the case again. As soon as I entered the sick-room I observed that the left side of his face was completely paralyzed. The eye of the corresponding side was kept constantly open, even during sleep, contrasting strongly with the facial paralysis due to a central lesion of the cerebrum, in which the upper fibers of the facial nerve are not implicated. The paralysis affected his speech so that it was almost impossible to understand him. It seemed as though the tongue was too large and thick. The soft palate was drawn over to the opposite side; he had difficulty in swallowing, and taste on the corresponding side was deficient. There was a large periosteal abscess over the mastoid eminence, which fluctuated. I opened it, and considerable offensive-smelling pus passed out. On probing I found a fistulous opening in the mastoid process. There was discharge of pus from the ear. After syringing the ear I found large granulations present. On using an angularly bent probe I discovered a fistulous opening on the posterior wall of the external auditory canal, extending into the mastoid process. The late Dr. Henry, of this place, was called in consultation, and with him I saw the case a number of times. The patient grew gradually worse, suffering almost constantly from excruciating pain, except when relieved by large doses of anodynes. He became more paralytic, had more difficulty in swallowing and in speech, and suffered from subjective sensation of heat and cold, till death finally relieved him, six months after the inception of the malady.

Symptoms. When in the course of a suppurative inflammation of the middle ear there is constant tenderness on pressure over the mastoid process, edema and swelling, with the ear pushed out from the head or not, we may suspect mastoid abscess.

The treatment may be divided into general and local. The general treatment includes laxatives and anodynes. Locally may be applied the rubber coil or bags of ice. When heat is desired, a rubber bag filled with hot water may be placed behind the ear, or small sacks filled with heated bran or salt may be used. I would warn against the too common use of injecting hot water into the external auditory

canal, or the application of poultices over the ear, as the moisture and heat increase the pus-formation, and this, as will be readily seen, is dangerous in a closed cavity like the mastoid process. Another mistake often made by general practitioners is the habit of filling the external auditory canal with powdered boric acid when there is discharge from the ear; this will close the fistulous opening or the ruptured drum-membrane, and thereby prevent free drainage. The injection of H_2O_2 has a tendency to thicken the pus and thereby prevent its free exit. The surgeon or specialist will open the cavity or enlarge the already existing fistulous opening which is too small for free drainage.

Two methods of opening the mastoid antrum are in use: One by boring with a drill; the other by chiselling into the cavity with chisel and hammer. In young children, and in those cases in which the bone is softened, the operator may often open into the cavity by pressing well down with a strong knife.

The chief landmarks for the surgeon are the temporal ridge and the external auditory canal. The opening should be made one-half inch below the temporal ridge and one-half inch posteriorly to and parallel with the external auditory canal. The chief risk lies in the danger of injuring the lateral sinus, which may easily occur to a careless operator, but if the foregoing precautions are observed there is little danger.

I will cite here another case in which the cavity was opened, and the case terminated favorably in a very short time.

CASE II.—R. A. C., American, aged fifty years; a saloon-keeper, healthy, living only a block from my office; came for me to examine his ear the 1st of April, 1892, when he complained of severe pain on the right side of the head, radiating from the ear in all directions. There was partial deafness and tinnitus. On inspecting the affected ear, I found all the symptoms of suppurative inflammation of the middle ear. He was treated in the usual way. The case progressed rather slowly, but I hoped for a favorable termination. He was never confined to his bed. He had greatly improved three weeks after the first treatment. About this time he went to Centralia, exposing himself, and on his way home he got wet in a cold April shower. After he came home he suffered with a chill, and in a few days all the ear-symptoms took on an acute exacerbation. The pain was very severe, deep tenderness over the mastoid process developed simultaneously, and a day later there was swelling and edema of the mastoid prominence. I recommended opening of the abscess, to which the patient consented. On the 24th of April, with the assistance of Drs. Carter, of Nashville, and Beckmeyer, of Addieville, we proceded to open the abscess. The head for a short distance around the process was shaved and thoroughly cleansed with soap and water, and then with an antiseptic solution. A crescent-shaped incision, posterior to the ear and with its concavity toward the ear, was made, and then a cross incision at right angles from the first was made, extending backward. The pericranium was pushed back and the bone examined to see whether or not a softened place could be found. As we could not discover this, an opening was bored with the triangular centerpiece of a three-quarter-inch Galt trephine. Great care was taken in directing the trephine-point, so that it was parallel with the external auditory canal and one-half inch below the temporal ridge. After boring down fully three-eighths of an inch, dark blood oozed out, and it was thought best not to bore any deeper.

This patient expressed himself perfectly free from pain after he recovered from the anesthetic, and made a very rapid and uninterrupted recovery. The wound was not closed, but dressed and treated open, in order that drainage might be free. The objection to the boring is, that the operator has to work in the dark and does not know when he has entered the mastoid antrum; for this reason I think that the chiselling procedure will supersede the boring.

OBSERVATIONS ON THE TREATMENT OF ASCITES BY FARADIZATION OF THE ABDOMEN.

BY ROBERTS BARTHOLOW, M.D., LL.D.,
OF PHILADELPHIA.

ON first view it would hardly be credited that an effusion into the peritoneal cavity could be made to disappear by faradization of the abdominal muscles. Nevertheless, many cases have been reported, and I have had personal experience of two instances. The most recent paper on this topic that has fallen under my observation is that of Prof. Dr. Glax,[1] who reports on some new cases supplementing a former paper, and at the same time giving an account of the literature of the subject so far as it exists.

Although, as we shall presently show, ascites of widely different origin can be successfully treated by electricity, there are some contra-indications to the use of this agent. Not all cases are suitable for the applications of a remedy causing such violent concussion of the abdominal contents. Cases of acute or subacute peritonitis, when general soreness and tenderness accompany the effusion; or when a general peritonitis succeeds to a local inflammation —such as typhlitis—and ascites results,—these conditions are unfavorable for faradization. However, after all acute symptoms have subsided, and tenderness has disappeared, faradism may be resorted to, for cases of this character have been successfully treated by faradism.

The ideal case of ascites for electric treatment is that of complete distention of the abdomen caused by portal obstruction of a remediable character. Usually, however, the case is one of cirrhosis due to

[1] Centralblatt für die gesammte Therapie, November, 1892.

the alcohol-habit. In such an example the ultimate result depends on two factors: on the amount of hepatic substance remaining in a condition to functionate; on the ability of the patient to free himself from the alcohol-habit. It is understood that every organ of the body contains an excess of structural material above the needs of its function, and hence may lose some parts without becoming unequal to its place in the organism. Cases of ascites caused by cirrhosis getting permanently well under faradism may be of such kind. The last case in my charge was one of portal obstruction caused by alcoholic excess, the patient indulging enormously in champagne-drinking. Daily applications of the interrupted current to the abdominal muscles caused the fluid to disappear in four weeks, with, apparently, complete restoration of the general health. Of course, permanence of the cure depends on the patient refraining from further indulgence. The ascites of cirrhosis has been successfully treated by Solfanelli,[1] the original proposer of the faradic method, and by Alvarenga,[2] who appears to have been the second advocate of this plan. Ascites of chronic nephritis has been reported as cured by Muret,[3] whose experience was gained at Strasbourg, in Kussmaul's clinic, by Erb,[4] and others. Glax[5] refers to three cases of mitral insufficiency, and one of chronic peritonitis, in which the effusion was absorbed; and Muret cites two cases due to splenic tumor, and one of chronic tuberculous peritonitis, in addition to those already given, the result being the same—*i. e.*, disappearance of the effusion.

The explanations of the curative action of faradism in cases of ascites differ somewhat. It is urged by Solfanelli, by Segrist, and by Glax that strong muscular contractions be induced. Such advice does not necessarily imply that the effects of the current are supposed to be mechanical only. Erb maintains that reflex and catalytic actions, rather than mechanical, explain the absorption of the fluid. By Muret, Glax, and others the effect is attributed to the strongly contracting muscles acting on the contents of the cavity, but especially to the impression on the peripheral nerves reflected over the renal nervous apparatus, and to the reflex action proceeding through the medulla oblongata to the vasomotor system, thus affecting the vascular tension. These remote effects of abdominal faradization have been experimentally studied by Glax, who likens the action of faradic electricity applied to the epigastric region to the "crushing-blow experiment" of Goltz. Indeed, Busch[6] reports a case of syncope induced by the faradic current applied to the epigastrium.

Some late investigations into the effects of abdominal massage throw light on this subject—for a certain similarity exists between the mechanical and reflex effects of massage and the mechanical and dynamic actions of electricity. Eltz,[1] following up the investigations of Riebmayer and Nothnagel, confirms the conclusions of his predecessors, and ascertains that abdominal massage increases the absorption of intraperitoneal and intestinal exudates and the flow of urine. The effects of abdominal massage on the renal secretion have been studied especially by Hirschberg,[2] who finds that the amount of urine discharged is greatly increased, and this is a constant phenomenon. It is undoubtedly the case that massage of the abdomen acts mechanically on the organs within, and especially on the intestinal contents. I have known a case of intestinal obstruction, which resisted the best efforts of several physicians, to yield in an hour to the manipulations of a masseur, who was at the same time a practitioner of the black art.

These facts respecting abdominal massage rather indicate that the effects of faradism, in causing the absorption of the fluid in ascites, are more reflex than mechanical—more the increased action of the absorbent vessels and of the kidneys than the mechanical impact of the contracting muscles. The catalytic effects of the current on which Erb insists constitute a mysterious property—more an attribute of the galvanic than of the faradic form of electricity, if for no other reason that the galvanic is far more diffusible.

As the vasomotor and trophic actions are more affected by the galvanic current, I have sometimes resorted to the combined galvano-faradic, interrupted from sixty to eighty times per minute. There is another mode of applying the two currents simultaneously: by maintaining central galvanization, whilst the faradic is used by the ordinary arrangement of electrodes. Central galvanization may be accomplished as follows: by placing one electrode—the anode—over the seventh cervical vertebra, and the other—the kathode—on the epigastrium, and thus permitting a stabile descending current to flow steadily for the required time. With such an arrangement of the electrodes, the great central organs of the nervous system of animal and organic life are included within the circuit. At the same time that the central galvanization is proceeding, static electricity may be used instead of the faradic. This form of electric action is capable of more powerful muscular effects, with less of discomfort than faradic electricity. As Solfanelli, Alvarenga, Glax,

[1] The Practitioner, London, vol. xli, pp. 448.
[2] The Practitioner, loc. cit. [3] Ibid.
[4] Ziemssen's Cyclopedia, volume on Electro-therapeutics.
[5] Centralblatt für die gesammte Therapie, supra.
[6] Quoted by Glax: Centralblatt f. d. ges. Therap., loc. cit.

[1] The Practioner, supra.
[2] Bulletin Général de Thérapeutique, vol. cxvii, p. 259.

and Muret[1] insist on the necessity for strong muscular contractions, it may be better to make use of static electricity, and I have done so, as just stated, in the last case under my charge—with apparent advantage, but I am not prepared to say that it should be applied exclusively or in part in any case. I have employed the Toepler-Holtz machine, which is arranged in an air-tight glass case, the discharging rods outside. To procure a sufficient amount of action, the rods are so adjusted as to permit sparks to pass at intervals of from sixty to one hundred per minute, and the current is tapped by connecting the electrode wires with the inner and outer parts of the Leyden jars.

Either of two plans may be pursued in applying the faradic current: one electrode placed on the upper dorsal vertebra, and the other moved over the abdominal wall, so that each group of muscles is acted on, or both electrodes held in one hand, according to the method of Duchenne, and each group of muscles made to contract several times before passing on to the next. Fatigue of the muscles should be avoided, for this indicates that the applications have been too protracted or too strong. The *séances* should not exceed fifteen minutes in duration, and they need not be more frequent than once a day. In some of the reported cases the faradic applications have been made two and three times a day, and with increased rate of improvement; but, as a rule, once a day suffices.

The improvement noted begins immediately, and an actual diminution in the girth of the abdomen is observed from a single application. The more fully distended the abdomen the more promptly does absorption occur, but the rate of absorption lessens with the diminishing fluid.

THE USE OF THE CURETTE IN ABORTION.

BY R. E. SKEEL, M.D.,
OF CLEVELAND, OHIO.

No one who forms the habit of examining the pelvic organs of all married women applying to him for relief from general nervous symptoms, as well as local evidence of intra-pelvic disease, can fail to be struck by the great number of cases of endometritis, salpingitis, and old pelvic exudates, dating from a miscarriage or abortion. In many of these cases the patient either did not employ a physician, or did not summon him until serious symptoms, such as profuse hemorrhage, foul discharge, or severe pain, had occurred. In other cases the physician was called, but resorted to the old temporizing measures, because the patient objected to active treatment, or because he did not believe it indicated. Nearly all, if not all, of these serious sequelæ might be avoided by proper treatment with aseptic or antiseptic precautions. Too often the medical attendant is inclined to relieve the mind of his patient by assuring her that she will be all right, trusting to luck to avoid any immediately serious consequences, and hoping that the remote ones will not be properly traced.

The ignorance of the laity is often a bar to proper treatment, and we should do all in our power to educate them to recognize that an abortion is not a simple matter, but that, owing to frequent retention of secundines and, before the third month, the decidua vera, it is extremely likely to be followed by serious disorders.

The use of the curette is sometimes condemned in all cases in which membranes or placentæ are retained, unless serious symptoms supervene, and this objection is based on the theory that there is danger of infection, and that all shreds of decidua cannot be removed in this manner. Theoretically this does not appear to me to be true, and practical results prove that the immediate removal of all retained products of conception, and, before the third month, curetting to remove the decidua vera, is followed by results as nearly perfect as can be asked for. If we can fearlessly enter the uterine cavity and curette for endometritis, we can as safely do so for the removal of foreign matter retained there, and with as little danger of infection. Further, it has been proved that the cervical canal contains microbes that under ordinary circumstances are harmless, but which readily become virulent in the presence of dead animal matter. That all shreds of decidua can be removed I am certain, from an experience in a considerable number of cases.

Clinically, three classes of cases present themselves to us, leaving out of consideration those in which prophylactic measures may prove successful:

1. Cases of inevitable abortion.

2. Those in which the ovum, in whole or in part, has recently come away.

3. Cases in which, after the lapse of some time, hemorrhage, or decomposition, or pelvic peritonitis, has occurred.

In the first class of cases we meet with a few in which the hemorrhage is very profuse before dilatation has occurred, and here the great majority of authorities agree that immediate dilatation is required; with a careful scooping out of the ovum either with the finger or ovum-forceps. In addition to this, as we are obliged to enter the uterine cavity, it would seem advisable to use the curette in all cases occurring before the third month, for the purpose of removing the hypertrophied mucous membrane forming the decidua vera. If this is not curetted it will generally come away in shreds,

[1] The Practitioner, vol. xli. p. 448.

and from the entrance of air it has abundant opportunity to putrefy and set up septic trouble.

In cases with only moderate bleeding the *antiseptic* tampon, properly used, will control the hemorrhage, and at the same time secure rapid dilatation and frequently expulsion of the ovum. If this comes away entirely, it may be debatable as to what is the best course to pursue. The vast majority of cases have no further trouble, but the thickened decidua is certainly a foreign body, and it would seem best to proceed with a thorough scraping. If the ovum is not expelled after a few hours, it should then be removed by the finger and curette, as nothing is to be gained by further delay.

In the second class of cases, unless we have seen the ovum and are positive that it is entire, it is far better to thoroughly but gently scrape over the surface with the Récamier curette, the danger from this procedure being much less than that of retention of matter that so readily becomes septic.

The cessation of pain and hemorrhage is not positive evidence of the complete expulsion of the uterine contents, although the converse is undoubtedly true. In those cases in which hemorrhage persists or the lochia are offensive, no one will object to the removal of the retained matter, and here again the curette is the only instrument at all effective, removing, as it does, all shreds and attached portions of membrane, and leaving no nidus to favor the development of bacteria, to result in the production of a purulent or hemorrhagic inflammation of the endometrium in later years. When pelvic peritonitis has occurred, the same principles should apply, but the treatment, advocated by Polk, of subsequent drainage certainly looks feasible. In this class of cases there is not the immediate improvement which follows when a pure sapremia exists, but the primary infecting center should none the less be removed.

This operation can be safely performed with lay assistance only, if professional help is not obtainable. An anesthetic is rarely necessary.

A vaginal douche should first be given of 1 : 3000 hot bichlorid solution. The Kelly rubber pan or some similar receptacle is of great assistance. If the physician is obliged to do the operation unaided, the patient is placed in the lithotomy position, and the bivalve speculum, well sterilized, is introduced. The cervix is steadied with a tenaculum or tenaculum-forceps, and the sterilized sound is introduced to ascertain the size, depth, and position of the uterus.

A Récamier curette, the large end of which is dulled by rubbing on a whetstone, or by filing, is introduced and the entire uterine cavity is thoroughly gone over without any great amount of force. Sterilized hot water or hot bichlorid solution, 1 : 10,000, is now used to wash out the débris, and, when no more comes away by washing, the uterine wall is again gently scraped, to ascertain whether anything still remains attached to it. If nothing more is removed, the uterus is again thoroughly washed out, a final vaginal douche is given, and the antiseptic pad applied over the vulva. Of course, perforation of the uterus is possible; but this ought never to happen if the curette is handled gently and no undue force is used.

I am aware that the principles urged in the foregoing are in the main those advocated by Hirst; but it is the writer's object to emphasize the connection existing between the retained products of conception and infection followed by acute or chronic endometritis, and to urge the use of the curette more generally to avoid these disastrous after-effects.

Like the uterine sound, the curette is capable in careless hands of doing great damage, but properly used it is also, like that instrument, invaluable.

ALBUMOSE.

BY R. W. FISHER, PH.G., M.D.,
OF SALT LAKE CITY, UTAH.

THE presence of albumose in the urine has not received the attention it deserves; in the first place, because of its rarity, and in the second, because it seems difficult to associate the substance with any particular pathologic condition.

Nearly all writers on the chemistry of the urine either quote from some other work or give it some new name, till the subject is much bewildered and the chemical reactions are not well understood.

That this form of albumin is much oftener present than recognized, is, I am quite sure, owing to methods used. The routine method in general use, as is well known, is to add acetic acid to the urine and boil. If this gives no reaction it is taken as final. As the reactions given further on will show, this would fail to demonstrate the presence of albumose.

Bence Jones was the first to write on this subject. He found albumose in the urine in a case of molities ossium, and gave it the name of hydrated deutroxid of albumin. Kuhne also describes a case and gives it the name of hemialbumose. Da Costa describes a number of kinds of albumin, and to this one gives the name albumose, which I have adopted. Roberts does not record any cases but says it is considered identical with the pro-peptone of Schmidt-Mulhein, and with the peptone of Meissner.

Peptone is very frequently found in the urine in cases of rheumatism or when the exudation is being absorbed in pleurisy or pneumonia, and should be carefully excluded.

The best test for peptone is the overlaying test

with Fehling's solution, which gives the rose-colored zone; but if albumin is present the color is purple. Potassium ferrocyanid and acetic acid give a precipitate with albumose, but not with peptone.

All the writers on this subject have made the same mistake in stating that albumose is not precipitated by heat. If the urine is very acid, or if there has been any acid added, there will not be any precipitate on heating. Holland, in speaking of this, called it acid albumin.

In making a test, one should be sure the urine is not too acid; otherwise there will be no precipitate and this form of albumin will escape notice. There must be some change in the kidneys, as in all the cases I have seen there were hyaline casts.

My attention has only recently been called to this subject, and I have had no opportunity to examine the kidneys post-mortem. In my experience the substance has always been found in some diseased condition of the bones.

Whether there is any connection between the two conditions, I am not prepared to state at present.

The following are the tests for albumose. It is precipitated by alcohol, carbolic acid, nitric acid, chromic acid, mercuric chlorid, tannic acid, picric acid, and metaphosphoric acid. If the urine be first acidulated with acetic acid, albumose will be precipitated by potassium ferrocyanid, potassio-mercuric iodid, sodium chlorid, magnesium sulphate. All these precipitates are dissolved by heat.

The best method for separating the proteids is given by Da Costa. Saturate the urine with ammonium sulphate, which will precipitate ovalbumin, serum-albumin, paraglobulin; collect on a filter and test the filtrate for peptone. Dissolve the precipitate in distilled water and acetic acid, add ether, and if ovalbumin it will be coagulated. To the solution add magnesium sulphate and acetic acid, and paraglobulin and albumose are precipitated. Da Costa says magnesium sulphate will precipitate albumose, but unless acetic acid be added there will be no precipitate If the precipitate will dissolve on heating, it is albumose; if not, is paraglobulin.

The mistakes that are generally made are in confounding albumose with peptone, mucin, and paraglobulin, but with a little care and applying the well-known tests these can be excluded.

Aneurism of a Sinus of Valsalva.—At a meeting of the Medical Society of Hamburg, SIMMONDS (*Deutsche medicin. Wochenschr.*, No. 51, 1892, p. 1171) presented an aneurism of a sinus of Valsalva that had pushed a leaflet of the pulmonary valve before it, and had ruptured into the pulmonary artery. The aorta displayed the remains of a previous endocarditis, two leaflets being agglutinated. The specimen was obtained from the body of a man, forty-two years old, who had died with symptoms of profound pulmonary edema.

ORIGINAL LECTURE.

PROLAPSUS UTERI.

Delivered at the Philadelphia Hospital, October 22, 1892.

BY E. E. MONTGOMERY, M.D.,
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I BRING before you to-day a patient, fifty-three years old, who presents a history of having suffered from so much pain in conjunction with a scanty menstrual flow as to be confined to bed during the entire period. Some years ago she noticed a settling down of the uterus, when she suffered from disordered menstruation, pain and tenderness in the pelvis and a profuse discharge. She has had two children at term, and two miscarriages, one at the second, and the other at the fourth month. In both of her confinements it was necessary to use instruments, and she was torn; a prolapse of the uterus took place after the birth of the first child, twenty years ago. She has done heavy work for many years, and in addition has suffered from troublesome cough and from constipation. She gives no history of abdominal enlargement. The measurements between the spines of the ilia are 27 cm., between the crests 29; Baudelocque's diameter is 18. She underwent an operation two years ago in the Presbyterian Hospital, when a portion of the uterus was removed.

I have not [illegible] yet had an opportunity to examine the woman, and bring her before you to-day for that purpose. As I separate the vulva, you notice there is a slight protrusion of the posterior wall of the vagina, which is known as a rectocele; if situated in the anterior segment, or anterior wall of the vagina, it would be called a cystocele. As I introduce my finger I find it comes in contact with the bar of a pessary, and it is probably due to the presence of this instrument that there is no greater displacement. As I withdraw it I find that it was situated wrong side up. This may have resulted, however, from its having been displaced in walking. As I introduce my finger into the vagina I find the uterus to be flush with it. The uterus is small and the vagina completely relaxed. If the woman engaged in slight exertion and straining, the protrusion of the vagina would be greater than it is.

This pessary is known as a retroversion pessary. In a patient like this, with the cervix entirely gone, it has no effect other than to distend the vagina and prevent the vaginal walls from being relaxed. In order to sustain the uterus when retroverted there must be a sufficient amount of the cervix projecting into the vagina for the pessary to act upon and drag backward. The pessary does not serve as a support for the fundus of the organ, but as it draws back the posterior fornix of the vagina, the traction is exerted upon the cervix, which is drawn backward and upward, the other end of the lever—the fundus—being tilted forward.

In introducing the pessary you separate the vulva with the left hand; then, taking the pessary between the thumb and the forefinger of the other hand, its posterior bar is held parallel with the axis of the vulva, and is pressed against the posterior commissure of the perineum, pushing this backward until one-half of the

pessary has entered the vagina. It is then rotated, and, with the finger placed against the posterior bar, the latter is carried behind the cervix into the posterior fornix.

The next patient is a woman, eighty years old, who enjoyed perfect health until three years ago. Her menstrual life was regular and painless. She has had four children at term and two miscarriages, the latter occurring at the beginning and end of her childbearing life. Her occupation was that of a cook, necessitating her being much upon her feet. She has always suffered from constipation; her labors were natural and easy. She never suffered with violent cough, nor has she had any abdominal enlargement.

This patient presents a most interesting condition. As we separate the limbs and expose the external genitals you see the entire uterus, covered by the vagina, projecting from the vulva. A portion of the bladder is situated in the anterior portion of this tumor; the external os and the cervix, as you see, have undergone some ulceration. This patient differs from the preceding one in presenting the condition that is known as procidentia, the latter term being only applicable to those cases in which the entire uterus makes its exit from the genital canal. Procidentia differs from the term prolapsus in being more definite and applicable only to those cases in which the prolapse is complete.

In the study of prolapsus and procidentia, it is well to consider for a moment the relation of the uterus in its normal position and the forces that conspire to maintain it. The organ is situated, as you remember, between the rectum posteriorly and the bladder in front; it is situated in the upper part of the vagina, projecting into it to a limited degree, the projecting portion being known as the vaginal portion of the cervix. The uterus does not occupy a fixed position. It may vary to a considerable degree from one position, and the change still not be a pathologic one. Thus, it may be pushed forward by distention of the rectum, or backward by distention of the bladder. It may be displaced downward by intra-abdominal pressure or by traction upon the cervix, to again resume its former position when the displacing influence is removed.

It is a point of interest to consider the forces that retain the uterus in its normal position. There has been much discussion upon what these are, some claiming that the uterus is set on top of the vagina like a cork in a bottle; so long as the vagina keeps its normal position the uterus is retained in place. Others attribute its support to the ligaments, notably the utero-sacral; when these ligaments lose their natural resiliency they no longer resist the displacement of the uterus, and are gradually elongated or atrophied until procidentia takes place. Some attribute the maintenance of the organ in place to the suction of the peritoneal cavity; some to the peritoneum. The truth is, it is not any one of these forces, but all combined.

In considering the ligaments of the uterus, it is well to remember that they have, running out in their folds, muscular structure from the superficial and middle layers of the uterus, and it is from the influence of this structure that the organ retains its normal position. To determine this fact, it is only necessary to drag upon the uterus, when upon removing the traction the organ will be found to resume its normal position. You will find the vagina represented in some text-books upon anatomy as distended. Such a condition, however, is abnormal, as the anterior and posterior surfaces lie in contact. The vagina lies at an angle of 60° with the horizon, and the uterus, with the bladder empty, lies with its axis at an angle of about 45° with that of the vagina, and the displacement of the uterus into and its exit from the vagina constitute a hernia just as much as would the emergence of any of the abdominal viscera through the femoral or inguinal canal.

One of the first tendencies to displacement downward is manifested in the change of relation of the axis of the uterus with that of the vagina. When the uterus becomes displaced backward, so that its axis is parallel to, or continuous with, that of the vagina, the patient suffers from increased abdominal pressure upon the fundus and back part of the uterus, bringing it down into the vagina as a wedge. The subsequent displacement of the organ is much more rapid, depending, of course, upon the degree of resiliency and resistance of the remaining structures. This tendency to displacement may be aggravated by two conditions; either a want of support in the genital canal, resulting from lesions of parturition, or increased weight and intra-abdominal pressure on the part of the uterus itself, or of any growths about it. When these two forces conspire together, the displacement is much more rapid. The weight of the uterus will be increased by a state of chronic inflammation or subinvolution from the presence of fibroid tumors in its walls. Intra-abdominal pressure is increased independently of the uterus by the presence of growths in the abdominal cavity, such as ovarian tumors, tumors of the omentum, liver and spleen, and from tight lacing.

The most frequent cause of displacement is a laceration of the perineum and of the vagina, taking place during labor. The effect of these lesions is dependent somewhat upon their extent. When the entire perineum is torn through to the sphincter ani there is at once a want of support of the anterior segment of the vagina, and the bladder becoming filled, the uterus resting upon it leads sooner or later to sagging down of this organ and the formation of what is known as cystocele. If the laceration has been extensive there will also be a turning out of the posterior wall of the vagina, giving rise to what is known as rectocele. The traction of the walls of the vagina upon the cervix leads to its being drawn lower down, and more nearly in the axis of the vagina; and in this way the fundus of the organ is tilted backward.

There are varying degrees of the displacement; thus, when the uterus has settled down to the vulva or rests upon it, the condition is known as prolapse of the first degree; when a portion of the uterus protrudes, the condition is known as the prolapse of the second degree; and when the entire organ has emerged from the vagina, the condition is known as prolapse of the third degree, or procidentia.

In some cases the traction of the walls of the vagina upon the cervix is not sufficient to lead to the displacement of the uterus. By dragging upon the cervix the heavy walls exert traction upon it, and if the fundus of the uterus be fixed by a normal, healthy condition of the ligaments, or by inflammatory adhesions, the supra-

vaginal portion of the cervix becomes elongated, until the cervix presents a cord-like attachment connecting it with the fundus of the uterus above. This condition is known as hypertrophic elongation of the cervix, and is one that must be recognized, as failure so to do will render the attendant unable to cope with the difficulty. A violent cough or obstinate constipation tends to aggravate the rapidity of the displacement. The occurrence of prolapsus is not an indication that the woman has borne children, as we not infrequently find women who, from defective muscular development, from obstinate constipation or other causes, may suffer from prolapsus of the uterus. Some years ago I saw a patient in whom prolapsus occurred from intra-abdominal pressure, during dancing. Examination disclosed the fact that she had an ovarian tumor, which had pushed itself down into the pelvis, and had consequently displaced the uterus.

Patients suffering from beginning prolapsus will complain of sensations of weight or dragging, as if everything was about to fall out. This is increased by muscular effort, straining, lifting, and by locomotion. There is more or less irritation of the rectum, possibly increasing the tendency to constipation. There is a sensation of discomfort in the bladder, increased by pressure. The patient is annoyed by frequent micturition. The vesical distress is greatly increased as the prolapse progresses. A portion of the bladder-wall becomes situated below the level of the urethra, so that the bladder is never completely emptied unless the pouch is pushed up. This is attended with decomposition of the urine in the cul-de-sac, and not infrequently with a deposit of calcareous material, which may result in the formation of a large calculus.

The diagnosis of prolapsus can be readily made by an examination of the protruding mass. If we find the protrusion to be situated on the anterior wall of the vagina, while the finger passes into the vaginal canal posteriorly to this, we recognize that we have to deal with a cystocele. On the contrary, if the finger passes anteriorly to the protruding mass, this is evidently a rectocele. These conditions may be present independently of the displacement of the uterus. When the tumor is situated centrally and is covered by the vagina on all sides, with an opening in the center of the protruding mass, we recognize it as a prolapse of the uterus. The protruding mass should, however, be carefully examined to see whether it includes the entire uterus or whether the cervix or fundus has been drawn out as already suggested.

How shall we treat these displacements? The earlier writers were in the habit of regarding the uterus as a sentient body, which could be frightened back into its normal position by being brought into contact with disagreeable objects. Soranus criticises his colleagues or competitors for placing the woman head downward for twenty-four hours with a view of correcting the displacement. The first consideration in treatment is to replace the organ in its normal position. This is ordinarily accomplished with but little difficulty. Tilting up the fundus of the uterus, bringing it into the canal and pushing upon the uterus, in this way inverting the vagina, the organ is replaced in its proper position. Occasionally the congestion of the uterus and tissues, resulting from the displacement, may have been of such a character as to lead to enlargement of the organ to such a degree as to prevent its being readily pushed back. In such cases it may be necessary to apply an Esmarch bandage to the surface of the tumor, thus pressing the blood out of it before it can be returned.

The protruding mass, exposed as it is to contact with the urine, to friction from the limbs and clothing, soiled with the discharges from the rectum, is not infrequently the seat of extensive ulceration. The tendency to ulceration is enhanced by the congestion of the organ and the consequently lowered vitality. When the uterus has been displaced for a length of time; when intestinal coils have followed it and have become adherent in abnormal situations, the replacement of the uterus may be impossible.

Having replaced the uterus, we have now to consider the manner in which its normal position is retained. This may be accomplished in two ways: by the use of pessaries or by a plastic operation. A great variety of pessaries have been introduced for this purpose. They may be divided into two classes: those without and those with external support. Those of the former class rest upon the posterior segment of the vagina and maintain the uterus in its normal position. When the vagina is large and roomy, or the uterus has been frequently displaced, or the displacement has existed for a considerable length of time, the retention of a pessary may be attended with difficulty.

The use of pessaries is not infrequently attended with discomfort. If the vaginal canal has been extensively injured, the pessary finds no point of support, and is readily pushed down and out. If the pessary is too large, and makes undue pressure upon the vaginal walls, it should be removed. From the secretions of the vagina calcareous material is not infrequently deposited upon the pessary, producing a roughening of its surface, which results in ulceration of the parts irritated by it. Wearing a pessary is at best attended with a good deal of discomfort, so that not infrequently a patient herself is willing to submit to any operation that will enable her to forego the necessity of wearing such an instrument.

In the patient before us, eighty years of age, no operation would be justifiable; her tenure of life is so short, the probability of successful result so slight, that it would not be wise to undertake an operation. We would suggest that the vagina be packed two or three times a week with iodoform-gauze and the uterus in this way held up. The incorporation of glycerin with the gauze will be of advantage. A great variety of plastic operations have been done upon the vagina and its outlet. Thus, the perineum has been denuded and a skin-flap made; in other cases a denudation has been practised upon the posterior wall of the vagina, extending up toward the uterus; or again, denudation has been done upon the anterior wall, in the form of a triangle or of an ellipse, in an oval denudation, and so on. In ordinary cases, probably as good a method of procedure would be to denude the surface upon either side of the urethra, on the anterior wall of the vagina, and suture this, as recommended by Skene. This may be done with buried catgut sutures. The posterior wall of the vagina may be operated upon by making a triangular incision upon its posterior surface down to the vulvo-vaginal communica-

tion, and then freshening the perineum below and introducing sutures in such a way that each drawing of a separate suture will result in lifting up the posterior wall of the vagina against the anterior. This imitates Nature's method.

An operation introduced by Le Fort some years ago consists in denuding a surface of about four-fifths of an inch on the anterior wall of the vagina with a corresponding one on the posterior wall, and bringing these two raw surfaces together by means of sutures in such a way that union takes place; the uterus is supported on the vaginal septum and the vagina is divided into two canals. This operation is one that is applicable after the menopause, but not prior to this, as we can readily understand that the occurrence of pregnancy under such a condition would be likely to result in serious laceration. In the majority of cases the operation suggested by Martin is probably the most effective. This consists in amputation of the cervix, thus securing a depletion of the uterus; second, the narrowing of the anterior wall of the vagina; and third, narrowing of the posterior wall and enlarging the perineum.

CLINICAL MEMORANDUM.

A CASE OF PUERPERAL ECLAMPSIA AT THE SEVENTH MONTH; WITH A FEW THOUGHTS AS TO TREATMENT FROM PRACTICAL EXPERIENCE.[1]

BY DOUGLAS AYRES, M.D.,
OF FORT PLAIN, N. Y.

PUERPERAL eclampsia, threatening, as it always does, the life of the mother, cannot fail to seriously disturb the mind of any practitioner of medicine, however extensive may have been his experience. The mother, if she be in labor, suddenly complaining of pain in the head, perhaps of some derangement of vision, epigastric pain, dyspnea, etc., soon has a convulsive seizure, which, if once seen, can never be mistaken. The staring eyes, the wonderfully rapid contracture of the facial muscles, the rolling eyeballs, and the contracture of the muscles of the neck, drawing the face to the extreme right or left, with the livid appearance and protruded tongue, and saliva forced from the angles of the mouth, take away almost every semblance of "the human form divine." This, together with the contracture of the muscles of the extremities as well, is a condition which has doubtless been witnessed by every physician within hearing of my voice; and all who have seen it will acknowledge that it is one of the most serious conditions that we are called upon to treat; one in which the prognosis is always grave; one that requires early and most vigorous treatment. We can congratulate ourselves, perhaps, upon the fact that it is not of frequent occurrence, as various statistics prove that it occurs but once in about five hundred pregnancies.

I have selected a case that occurred in my practice during the past year for this report, on account of its occurrence at the seventh month of utero-gestation, thereby offering serious complications. It is not my purpose at this time to discuss the etiology of eclampsia, further than to say that it may be of uremic, reflex, or apoplectic origin; that, while albumin in the urine may be a very constant attendant, cases may occur without any, or scarcely any, being present. Great excito-motor irritability may act reflexly and produce uremic attacks, as irritation of the gravid uterus; but cases that can be traced purely to these causes, I judge, from my reading and practical experience, to be very rare. Those of apoplectic origin are undoubtedly the most fatal. I would say, in this connection, that I believe that those investigators who think that the greater proportion of these cases have their origin in uremia are correct; that is, uremia in a general sense, including any or all of the constituents of the urine that may be retained as the result of imperfect action of the kidneys, together with marked increase of arterial tension.

CASE.—The husband of Mrs. F. H. called at my office July 5, 1891, to inform me that she was seven months advanced in a second pregnancy; that there was some puffiness of the face, and some edema of the lower limbs. I requested a specimen of her urine of the twenty-four hours, which I examined with reference to the presence of albumin, of which I found a large amount. The quantity of urine passed we estimated to be about one-third less than the normal average, or about thirty-four ounces. The usual treatment was advised: mental quietude, milk-diet, with iron tonics and mild laxatives.

About 4 P.M. of July 9th (four days after the first call) I was again hastily summoned to attend her. Her mother gave me the following history: She had felt as well as usual on that day, until the afternoon, when she had complained of some pain in the head and had gone into another room to lie down upon a couch. Shortly afterward the mother heard a sound as of something falling, and hastily went into the room, where she found her daughter lying upon the floor in an unconscious condition. There were slight convulsive movements. She recovered consciousness in a short time, when they placed her upon the couch, where she lay quietly, asking some questions with regard to what had happened, but in a somewhat dazed manner.

When I arrived, she seemed perfectly conscious of her surroundings, and answered intelligently the few questions that I asked her. I remembered that I had attended her in confinement eleven years before, and that immediately after the birth of the child she had an eclamptic convulsion, for the relief of which I bled her very freely (nearly thirty ounces), which seemed only sufficient to reduce the force and volume of the pulse, after which she rallied; and very luckily there was no recurrence.

I found her face puffy, and the lower extremities quite edematous. She was thirty-six years old, a person of full habit, weighing perhaps one hundred and forty or fifty pounds. The kidneys had acted about as usual (as well as the family could judge) for the past few days; if there was any change there was a little falling off in the amount of urine passed, from our previous estimate. I found a full, strong pulse, flushed face, and heat of head. I ordered cold applications to the head, and, as the bowels had not acted as freely as desirable, also a stimulating enema, which met with a fair response; and gave immediately afterward a full dose of calomel and jalap. She was soon seized with a severe convulsion. I immediately opened a vein, with a good free opening, from

[1] Read at the meeting of the New York State Medical Association, November, 1892.

which I allowed the blood to flow, until its effect was very perceptible upon the pulse (which required the loss of nearly twenty-five ounces), when she slowly returned to consciousness. I then made a vaginal examination, and found the os somewhat softened and dilatable.

There were at this time marked labor-pains. Making use of the fingers as my dilators, I began slowly and carefully to dilate, and found that the parts yielded very satisfactorily. When the efforts of the uterus, which had now somewhat increased, had pressed the head well down in the os, I administered three-quarters of a dram of fluid extract of ergot, with one-third of a grain of morphine, and shortly after applied the forceps, making gentle traction with each expulsive pain; and in a short time succeeded in delivering a dead child. The uterus was well and carefully kneaded, and within one-half or three-quarters of an hour the placenta was expelled.

There was but a moderate amount of hemorrhage, as the uterus seemed to contract fairly well. The patient was now breathing easily, but was quite unconscious, making an effort to open the eyes, if spoken to in a raised tone of voice; the pulse was of fair strength and regular. I found that she could swallow, and ordered a few ounces of milk, which was slowly given. She remained in this condition for about three hours, when another convulsion occurred, which was perhaps, as to tonic contraction and length of time, not so severe as the last. Shortly after this attack I relieved the bladder of several ounces of urine, and found it to contain about the same quantity of albumin.

I should have made use of chloral before this time; but as I was some distance in the country, and found that I had none with me, I was not able to do so. I obtained some, however, about two hours later, at which time there were evidences that another convulsion was about to occur. I immediately injected, per rectum, fifty grains, properly guarded with mucilage, having found that a less amount does not usually produce the desired effect. The woman was quiet from this time as to any evidences of contracture for nearly six hours (breathing as in sleep); when with the first evidences of muscular movements the same amount was again injected. I found this to be necessary at about the same intervals, until four injections had been administered; when all evidences of recurrence ceased. This was about thirty-six hours from the second attack. The bladder was relieved during this period at intervals of six or seven hours, each time of a few ounces of urine, which was of about the same character as to appearance and amount of albumin as the first drawn.

The patient remained unconscious for nearly fifty hours, but was able to take some nourishment, which was given in the form of milk at regular intervals, or at such times as she could be induced to swallow. From this time she slowly began to recover; her convalescence extending over a period of sixteen or seventeen days, during which time she suffered from amblyopia to such a degree as not to be able to recognize the members of her family or any object brought within the usual focal distance. There was a good deal of muscular tenderness, and quite marked prostration. The after-treatment was tonic and alterative, under which she made fairly rapid progress to complete recovery.

There are a few questions of importance which the treatment of this case suggests:

1. What of the importance of venesection for the relief of the condition?

2. What cases would be most likely to be benefited by it?

3. What of the use of chloral as a therapeutic measure, as against chloroform by inhalation and morphine by subcutaneous administration?

I believe, as to the first, that its prompt action renders it an agent of the utmost importance; that it relieves the brain by lessening the force of the circulation and consequent arterial tension, and many times wards off a serious brain-lesion; but that it be practised early is of the utmost importance, before irreparable injury has been accomplished. Again, it gives us time to make use of other remedial agents, such as will relieve the general oppression, and, as a prominent writer has said, favors absorption and renders the patient more susceptible to their influence.

Secondly, I believe that women of full habit, with suffused face, and full, slow pulse, showing much arterial tension, will always be greatly benefited by venesection. My personal experience has been that when this important measure has been neglected the difficulty has much more frequently proved fatal. I call to mind in this connection, eight cases, seven of which were consecutive, that I treated by bleeding, three with the addition of chloral to the treatment, with a mortality of one—that one a primipara six months advanced. She was a person of full habit, had two very severe convulsions before I saw her, and, although I bled her freely, there was no return to consciousness; and I judged from the evidences that a serious brain-lesion had taken place early, perhaps with the first seizure. Barquissau says: "It diminishes the general mass of the blood; relieves the nerve-centers, which have a tendency to become congested; and by making the spinal bulb anemic, we deaden reflex irritability, which keeps up the hyperemia and by which the convulsive attack may be revived."

It is now somewhat more than twenty years since chloral hydrate became generally known as a remedy in the treatment of eclampsia, either by the mouth or otherwise. My first experience in the use of it was subcutaneously. I was called in consultation in a very severe case, in which the patient had suffered from a number of convulsive seizures after free venesection. I had seen, a few days before, an article in one of our journals with regard to the use of chloral hydrate subcutaneously in these cases. I advised it, and we made trial of it, injecting freely in the lower extremities. It relieved our patient, but it was some time before the ulcerations, resulting from the irritation caused by the chloral, were healed. I have since used it per rectum (thereby avoiding a repetition of my first unpleasant experience), as it is much more quickly and easily administered in this way, and as many times it cannot be given by the mouth. I should certainly much prefer it to chloroform; for, although chloroform arrests the convulsive seizures, it usually does so only for a short time, and the patient cannot be kept under its influence for a considerable length of time without danger. Some of the more prominent objections to its use that have been mentioned are that it produces congestion of the

nerve-centers, and so may increase cerebro-spinal congestion; also the asphyxia, to which complication there is a predisposition. Depaul admits that to a certain extent it does modify the eclamptic attacks, but says: "They exist none the less, as well as the complications—congestions, central hemorrhages, pulmonary congestions, etc."

There is no doubt but that we have in morphine and chloroform valuable remedies, the effects of which have been closely and practically investigated by the profession, and that they have held their place in professional confidence. Still, it seems to me that some of the arguments presented, especially those against the long-continued use of the latter, are well chosen. As to morphine subcutaneously, I could fully indorse its use, in doses not to exceed a quarter of a grain, to be repeated in case it be found necessary within a limited length of time, say one hour; but I should fear the heroic doses recommended by some writers, of from one-half to one grain, and boldly repeating upon evidences of recurrence; notwithstanding the fact that great tolerance of the drug has been urged in the eclamptic condition.

More definitely as to the last proposition, I believe that we have in chloral hydrate an agent of wonderful therapeutic value for the relief of reflex irritation; and that in the two, venesection first, judiciously, promptly, and boldly done, followed by chloral if the convulsions continue, we have measures that will never be supplanted by any more perfect or potent. After an experience of twenty-seven years of active practice, I can recall many cases treated in this manner, and the great majority have recovered: some by venesection alone, others by venesection and chloral hydrate combined. The former has, however, been my sheet-anchor, and I firmly believe that, if early and judiciously done, it will in the future, as it has in the past, save many mothers from an untimely death.

NEW DEVICE.

A SPLINT FOR FRACTURES AND LUXATIONS AT THE ELBOW-JOINT.[1]

BY CHARLES W. DULLES, M.D.,
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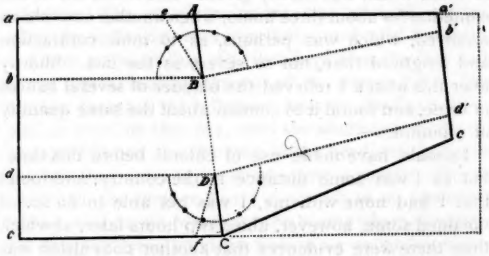
INQUIRIES in regard to a splint that I have devised for the treatment of fractures and luxations at the elbow having come to me, in consequence of a reference to it in a paper on "Fractures of the Arm," by Dr. John B. Roberts (*Annals of Surgery*, July, 1892), induce me to publish a description of it.

It is well known, and especially since the instructive publications of Dr. Oscar H. Allis on this subject, that one of the chief obstacles to the successful treatment of fracture at the elbow depends upon the difficulty of preserving the normal relation between the principal axes of the arm and forearm. The normal relation of these axes, when the arm is extended, is that of the two lines of an obtuse angle; and to preserve this, a certain number of surgeons have recently advocated and practised the treatment of fractures at the elbow by maintaining the forearm in full extension; for the reason that treatment by means of angular splints is often followed by displacement of one of the condyles of the humerus with loss of the normal abduction (outward, or radial, deviation from the plane of the axis of the humerus) of the forearm.

Ever since this danger impressed itself sufficiently upon my mind I have been using a splint which has proved quite satisfactory in my hands.

This splint, I make, for each case, from a sheet of light tin or sheet brass. On such a sheet I rule lines, guided by the sound arm, to mark out the relation of the axis of the forearm to that of the upper arm with the whole member extended. I then mark the points of the articular surfaces of the internal and external condyles and draw a straight line across the metal, passing (see figure) through them. With a strong pair of shears I then cut the whole splint out of the metal, and cut from the angles at the inner and outer sides toward the middle line (in the figure, from *A* to *B* and from *C* to *D*). I then make a few holes with an awl, as shown on the dotted semicircle, and bend the sides (*A a b B*, *C c d B*, *A a′ b′ B*, *C c′ d′ D*) backward (as the splint is to be reversed for



the injured arm) so as to form two troughs, and bend these troughs exactly along the line *B D*, so as to make an angular splint. Fixation at the angle required is secured by passing through the holes at the sides an ordinary brass paper-fastener and bending its ends over. The different holes permit of flexion at various angles greater than a right angle, and by cutting away from *E* to *B* and from *F* to *D*, different degrees of acute angulation may be obtained. Suitable padding with wool (which I prefer to cotton) completes the preparation of the splint, into which the arm is placed, with the forearm in supination, and in which it is confined by means of a bandage.

The splint is light and comfortable, and it permits examination of the joint at any time, without danger of displacement of the fragments, by simply removing the enclosing bandage. In describing it, I do not think it necessary to speak of the means for reducing or preventing traumatic swelling, which are guided by the principles so admirably taught by the late Mr. Sampson Gamgee.

The idea of the splint is to take a piece of light metal and convert it into a trough, the shape of which shall conform to the lines of the arm in extension; then to flex this trough along a line which corresponds with the true plane of the elbow-joint.

An examination of such a splint will show that it conforms to the proper lines of the arm and forearm in extension, and that on flexion the lower trough follows

[1] Read before the Philadelphia Academy of Surgery, December 5, 1892.

very closely the line of movement of the forearm as it approaches the humerus. At the same time it will be seen that the point at the angle in which the upper end of the ulna rests in flexion is lower than that in which the upper end of the radius rests, as should be the case, to conform the normal anatomic relation of these parts and the normal relation of the internal condyle of the humerus to the external condyle. The ulna being at the elbow-joint a thicker bone than the radius, it is well to have the wool cushion on the radial side a trifle thicker than on the ulnar side; but in many cases of fracture the first swelling compels one to adapt the cushioning rather to the condition of the soft parts than to the absolute size of the bones and the position of their surfaces.

A splint of this sort can only approximately imitate the conditions of the elbow-joint; but I think it does imitate them in a way conducive to good results in the treatment of fractures. So far as my experience goes, the results have justified my expectations.

Of course, I do not imagine that any one form of splint will prove suitable to every case; but this splint is light, clean, comfortable, and easy to apply, while permitting frequent examinations without risk to the position of the fragments, and changes of the degree of flexion as often as may be necessary, in each maintaining the normal relation of the axes of the arm and forearm.

A study of the elbow-joint, with a view to securing the proper position of the parts after fracture, has led me to believe that good results may be obtained by flexing the forearm quite fully upon the humerus, in which position both ulna and radius act as natural splints to the condyles. On writing this to Dr. H. L. Smith, of Boston, with whom I have had some correspondence on this subject, he tells me that he has already experimented on the cadaver in this direction, with the result of showing that, by this method (the forearm being semi-pronated), the condyles were fixed in a correct position. He has also treated some cases of accidental fracture in the same way, with good results.

If this experience should be repeated and confirmed by others, the splint for elbow-joint fracture would probably be a simple V-shaped one, placed against the outer side of the arm and the back of the forearm. With such a splint I am now treating an inter-condyloid fracture of the humerus. The patient is entirely comfortable; the bones appear to be in correct position, and I hope for a good result.

4101 WALNUT STREET.

MEDICAL PROGRESS.

Biologic Therapeutics.—In a recent address delivered at the New York Post-Graduate Medical School and Hospital, DR. WM. A. HAMMOND stated that he had prepared and had employed therapeutically extracts from the brain, spinal cord, testicles, ovaries, pancreas, stomach, and heart, which he calls respectively, cerebrin, medullin, testin, ovarin, pancreatin, gastrin, and cardin. The process of preparation of the brain, from which that of the other organs does not differ, consists, after its removal, in washing the organ in water acidulated with boric acid, and cutting it into small pieces with a mincing machine; then to 1 part of this, in a wide-mouthed glass-stoppered bottle, are added 3 parts of a mixture of equal parts each of a saturated solution of boric acid in distilled water, pure glycerin, and absolute alcohol. After standing in a cool place for at least six months, being well stirred or shaken two or three times a day, the mixture is permitted to pass through a porous stone filter. The residue upon the filter is enclosed in several layers of aseptic gauze and subjected to a pressure of over a thousand pounds, the exudate being permitted to fall upon the filter, and being mixed with a sufficient quantity of the filtrate to cover it. When it has entirely filtered through, it is thoroughly mixed with the first filtrate, and the process is complete. The greatest precautions are taken to prevent contamination. Turbidity can be overcome by filtration. Five minims of this extract, diluted, constitutes he dose for subcutaneus injection. The most notable effects of the injection are an increase in the frequency, strength, and fulness of the pulse; a feeling of distention of the head; increased perspiration; flushing of the face; occasionally headache; a sense of exhilaration; increased elimination of urine; increase of muscular strength and endurance; improvement of vision; increased appetite and digestive power. Two injections should be given daily, or on alternate days. Dr. Hammond reports that he has successfully employed cerebrin in various affections of the brain and spinal cord, including congestion, neurasthenia, migraine, hysteria, melancholia, hebephrenia, paralysis, neuralgia, sciatica, epilepsy, general paresis. In some cases cardin and testin have also been used. In explanation of the rationale of the method of treatment, it is suggested that in health every organ separates from the blood the special pabulum that is essential for its perfect nutrition and function, while in disease this selective action is perverted or lost. By supplying artificially, in cases of disease, the special product of the organ at fault, it is hoped to reëstablish the equilibrium.

Diaphragmatic Hernia.—ANNEQUIN (*Archiv de Méd. et de Pharm. milit.*, xxi, 1, p. 33) has reported the case of a healthy soldier, who for two years had suffered from recurrent attacks of severe colicky pain, referred especially to the epigastrium, unattended with diarrhea, and usually induced by active muscular exercise, and who, following some excessive physical effort, was seized with pain of unusual severity and with syncope. The pain failed to yield to the local employment of poultices and to anodyne enemata, but continued with paroxysmal exacerbations. In the course of a little while symptoms of intestinal obstruction appeared. The face became drawn, the nostrils distended; the respiration shallow and sighing; the pulse small, compressible and frequent; the extremities cold; the temperature subnormal; the urine deficient in amount, without other abnormality; the breath offensive. There was, however, no hiccough; the abdomen was retracted, except in the epigastrium; there was no evidence of the presence of an abdominal tumor or of hernia in any of the situations in which such a condition is wont to occur. There was no tenesmus, and anus and rectum presented no lesion. The abdominal pain was intense, but intermittent, and localized deeply in the epigastrium. Neither flatus nor fecal matter had been passed by the bowel for three

days. Liquids ingested were rejected at once. From time to time there was vomiting of a bilious fluid that had a fetid odor. The heart presented no abnormality. The respiratory movement was thoracic and restricted; the vesicular murmur was enfeebled. As the nature and situation of the obstruction could not be determined, and as the condition of the patient was considered too grave for operative interference, symptomatic treatment was instituted. Four days and a half after the onset of the attack, and thirty-six hours after entering the hospital, the patient succumbed. At the post-mortem examination a knuckle of the large intestine, at the junction of the transverse and descending colon, together with a portion of omentum, was found to have made its way through an opening in the left leaflet of the diaphragm. The bowel was situated behind the gastro-splenic omentum and in front of the kidney, and lay between the heart and the adjacent lung. The omentum had formed adhesions to the upper surface of the diaphragm and to the pericardium. Reduction could not be accomplishsd by simple traction. The stomach occupied a vertical position, and was twisted upon its axis. The duodenum was flattened and twisted, so as to be practically impassable.

Poisoning by Sardines.—STEVENSON (*British Medical Journal*, No. 1668, p. 1326) has reported the case of a military officer, twenty-one years old, apparently in good health, who, after making a breakfast of six hot sardines, some toast and coffee, became ill, vomited several times, and on the following day died. At the post-mortem examination the whole body, as well as the mucous membrane of the stomach and bowels, was found emphysematous. Some of the sardines obtained from the box that had contained those that the dead man had taken proved fatal to white mice to which they were fed. An alkaloidal substance obtained from the fish also proved lethal to mice. No characteristic bacteria were found in the sardines, in the gastric or intestinal contents, or in the liver. Animals treated with fragments of the liver and of the stomach succumbed. An alkaloidal substance possessed of toxic properties was obtained from the vomited matter and from the gastric contents.

Measles with Relapse.—STRENG (*Deutsche medicin. Wochenschr.*, 1892, No. 48, p. 1084) has reported the case of a six-year old girl, who for three days had had chilly sensations and impaired appetite, and for twenty-four hours a cutaneous eruption. The temperature was 99.8°, and rose no higher. The eruption was typical of measles. Conjunctivitis, rhinitis, and bronchitis were likewise present. On the seventh day after the appearance of the eruption, a purulent discharge from the right ear made its appearance, the temperature mounting to 101°, but declining almost to the normal in the course of the next two days. The eruption disappeared; the catarrhal symptoms subsided; and the subjective condition was good; when, on the tenth day, the temperature began to gradually rise, on the twelfth day reaching 103.8°, the morbillous eruption reappearing simultaneously; to these manifestations, conjunctivitis, rhinitis, and bronchitis were soon added. On the night of the fourteenth day the temperature declined by crisis, and thereafter convalescence was progressive, though further complicated by an eruption of pemphigus vesicles on the right ear and on the fingers of the right hand.

Actinomycosis of the Lip.—MARI (*Centralbl. f. Bakteriologie u. Parasitenk.*, xii, 24, p. 854) reports that in 1889, Klepzow, veterinary surgeon to the abattoir of Moscow, found beneath the mucous membrane of the lower lip of some slaughtered oxen hard, movable nodules of the size of peas or of small nuts, in the purulent contents of which were actinomyces. The observation was confirmed by other investigators, and among 2000 animals 112 cases of actinomycosis of the lip were discovered. In the months of March, April, May, and June, 1892, among 42,230 head of cattle slaughtered, 1030 presented actinomycosis, which in 621 was seated upon the lip. Section of a nodule disclosed a grayish-yellow point, often softened and purulent at the center, and in the pus the characteristic ray-fungus could invariably be demonstrated.

THERAPEUTIC NOTES.

Chloralose is the name given by HANRIOT and RICHET (*La Semaine Médicale*, 1893, No. 2, p. 14) to a crystalline body resulting from the action of anhydrous chloral upon glucose. The substance is exceedingly bitter, readily soluble in hot water, less readily in cold water. Adults will tolerate from seven and one half to fifteen grains, although from three to six grains are sufficient to produce calm, dreamless, refreshing sleep. The drug was borne by persons that could not take chloral or morphine, or in which these drugs failed to produce sleep.

Pancreatic Juice for Diabetes.—MACKENZIE (*British Medical Journal*, No. 1672, p. 63) has reported the employment of liquor pancreaticus, in half-ounce doses, given three times a day, immediately after food, in the treatment of two cases of diabetes mellitus, with benefit. Languor and lassitude diminished; the thirst lessened; and the quantity of urine became smaller, although the specific gravity of the urine and the percentage of sugar remained unchanged. In a third case similar results were obtained.

For Chancroid.—

℞.—Acid. carbolic. . . . . ℥ij.
Camphor. . . . . ℥v.—M.

S.—Apply topically by means of absorbent cotton, twice daily.

—GAMEL, *Journ. d. mal. Cut. et Syph.; Deutsche med. Wochenschr.*, 1893, No. 1.

Sodium Borate in the Treatment of Paralysis Agitans.—SACAZE (*La Semaine Médicale*, 1893, No. 4, p. 14) reports the case of a man, thirty-eight years old, in which the administration of sodium borate in doses of from 15 to 45 grains, in three or four equal parts in the course of the day, was followed by the most striking improvement in the symptoms of paralysis agitans that had developed after a fall upon the shoulder.

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METHYLENE BICHLORID.

IN his recent admirable work on anesthetics, DASTRE[1] observes that there is a true and false methylene chlorid, and that the true chlorid is not an anesthetic. If we inquire into the grounds of this opinion, we shall be puzzled to account for so dogmatic a statement. We find on examination that there are four different substances laying claim to the same appellation. For the sake of clearness they may be thus enumerated: First, there is the mythelene bichlorid prepared by ROBBINS, and described as "the distillation of chloroform and alcohol on zinc." It seems to be the true anesthetic, and has been used with success by SPENCER WELLS and RICHARDSON in England, and in France by MM. LE FORT and LABORDE.[2] Secondly, there is a mysterious substance, of English manufacture, which PROF. REGNAULT found on analysis to be a mixture of chloroform and methylic alcohol.[3] Believing this mixture to be the true anesthetic, he prepared a pure specimen, of which the proportions were 4 volumes of chloroform and 1 volume of methylic alcohol. His two colleagues, POLAILLON[1] and LE FORT tested it in their practice, and judged it dangerous. It is, in fact, not sufficiently powerful to produce insensibility in men. For women it answers tolerably. In physical properties it differs markedly from the English preparation of ROBBINS, which, as we have said, seems to be the real anesthetic, though not the real methylene chlorid. The real chlorid, of which the formula is $C_2H_2Cl_2$, was isolated by REGNAULT and VILLEJEAN,[2] and two careful physiologic studies revealed its utter uselessness as an anesthetic. We cite, for the light they throw on certain cases of death from the commercial drug, a few sentences from the last excellent paper of REGNAULT and VILLEJEAN: "At the present time we can assert, basing our opinion on the results of more numerous and more precise observations, that if chloroform brings on, at the same time as the general anesthesia, a state of muscular relaxation most useful in surgical operations, methylene chlorid on the contrary produces, during the inhalation and also after the inhalation, a state of (muscular) contraction both temporary and permanent, alternating with cries of a choreic and epileptiform character."

Such, indeed, are the symptoms noted in some cases of poisoning. Is it, then, to be thought that poisoning is sometimes or often caused by the real methylene chlorid? Such an assumption, we confess, is somewhat hazardous, for we have not been able to discover that the true chlorid is ever made in its purity except in the savant's laboratory. We lay stress upon this matter, first, because the question serves to make clear an element of uncertainty and danger in the use of the commercial drugs which profess to be methylene chlorids, when they are nothing but mixtures, of shifting and doubtful constitution. And lastly, some of these mixtures are definitely known to possess dangerous impurities, as DR. HENRY E. ARMSTRONG[3] has shown.

Having thus distinguished the four different substances (now) called by courtesy methylene bichlorid, of which we have any particular experience, let us come to the essential part of the whole question.

If we look now into the history and nature of ROBBINS's drug, we shall meet with one of the most singular facts in the study of this rather obscure

[1] A. Dastre: Les Anesthétiques, Paris.
Bulletin de l'Acad. de Méd., 1889, 3me sér., t. xxii, p. 35; t. xxi, p. 900.

[2] Ibid., 1884, 2me sér., pp. 568, 580.

[1] Ibid, 1889, t xxi, p. 897

[2] Société de Biologie, 1884, 8me sér., p. 156; Bull. de Thérapeutique, 1886, tome cx, p. 494.

[3] Lancet, vol. ii, 1884, p. 935.

subject. Although this drug is an undoubted mixture,[1] yet it differs in appearance and effect from a chemically pure mixture of chloroform and methylic alcohol prepared by REGNAULT, and well known in France as the *liqueur de Regnault*. On this interesting subject LE FORT says: "Whatever may be the results of chemical analysis, I affirm that the mixture of M. REGNAULT is not identical with the liquid I procured from London; the physiologic results are too different."[2] In another place he gives an account of his unsatisfactory experience with REGNAULT'S mixture. On the other hand, in speaking of the English drug, which he had used repeatedly during a period of six years, he is scarcely less reserved in his praises than SPENCER WELLS.

Here is a *résumé* of LE FORT'S last experiences: methylene bichlorid was employed 33 times, of which 16 cases were in men and 17 in women.

Results in men:	
Mean quantity used	15 grams.
" duration of the initial stage	13 minutes.
" " " anesthesia	32 "
Agitation, light	9 cases.
" severe	1 case.
Vomiting during the operation	1 "
" after " "	3 cases.
Results in women:	
Mean quantity used	10 grams.
Initial stage	8 minutes.
Duration of the anesthesia	32 "
Agitation, light	2 cases.
" severe	1 case.
Vomiting during the operation	1 "
" after " "	3 cases.
Fifty-eight cases with *chloroform* gave the following results:	
Mean duration of the initial stage	7 minutes.
" " " anesthesia	22 "
Agitation, light	23 cases.
" severe	7 "
Nausea and vomiting during the operation	6 "
" " " after " "	22 "

Whether these results show absolutely that methylene bichlorid is superior to chloroform as an anesthetic, it is not necessary to say. No one, as far as we know, has ever denied that it is safer than chloroform; and, as safety is in the long run the only point in these matters well worth discussion, we shall examine a little further the evidence for the English drug. SIR SPENCER WELLS, by far its most important witness and most plausible panegyrist, says: "I have now done ovariotomy 1138 times, and with the exception of about ten,[1] where for some reason or other chloroform was used, chloromethyl was the anesthetic employed." Again: "Its chemical composition shows it to differ from chloroform only in containing one equivalent less of chlorine,[2] and in a letter to LE FORT, SPENCER WELLS doubts whether the preparation of ROBBINS is, chemically speaking, true methylene bichlorid; but practically it is the best and surest anesthetic he has ever used.[3] It must be given freely diluted with air, a task accomplished best by means of JUNKER'S inhaler. In this way but from 2 to 4 per cent. of vapor is administered. To neglect of this rule he attributes a fatal accident at the Plymouth Hospital."[4]

These quotations show that SPENCER WELLS'S success, setting aside his personal ability and skill, has depended first upon some inherent excellence in ROBBINS'S drug, an excellence due perhaps to its containing less chlorine than chloroform, and to its nature as a mixture; and, secondly, upon the rigid observance of sound technique in the administration. Upon taking care, as we have ourselves noted personally and in our reading, depends all success in the use of anesthetics; and many malapert operators, by ignoring some sound method of manipulation, have hindered the development of practical skill—especially, it is to be added, in the administration of chloroform. In the present instance the care we wish to insist upon is, as experience shows, to be exercised in the choice of the means of inhalation. It is a matter of vital importance to afford a regular and graduated amount of vapor to the patient.

There have been not a few deaths from methylene bichlorid. In the *Lancet*, during the last ten years, there are accounts of seven, and this number, it is safe to say, represents but a fraction of the truth. DASTRE, we think, has summed up very shrewdly the defects of this agent, and we are disposed to concur with him in his disparagement of it. According to him, it possesses the defects, and not all the virtues of chloroform, and deaths from it are much more frequent than its advocates admit. Certainly it is hard to have confidence in a mixture in many ways dubious—a mixture that seems to differ, though for the better, from one of the

[1] Cf. Prof. Gutzeit: Deutsche med. Zeitung, 1887, p. 749.
[2] Bull. de l'Acad., t. xxi, p. 889.

[1] Diagnosis and Surgical Treatment of Abdominal Tumors, London, 1885, p. 77.
[2] Modern Abdominal Surgery, 1891, p. 8.
[3] Bull. de l'Acad., 3e. ser., t. xxii, p. 35.
[4] Lancet, 1890, vol. ii, p. 898.

same proportions made by a highly accomplished chemist. Yet it must be said in favor of ROBBINS'S mixture, and others like it, that the worst it has apparently done is to cause vomiting and unrest. We say "apparently," for the reported circumstances of fatal cases, with the single exception of the choice of an inhaler, are too obscure to be handled.

TUBERCULOUS INSPIRATION-BRONCHO-PNEUMONIA.

ONE of the most alarming manifestations in the clinical history of a case of pulmonary tuberculosis is hemoptysis, which may be of varying degree, from a slight admixture of blood with the sputum to a pint or more. The complication is of itself rarely fatal; occasionally, however, it causes death by asphyxia, the patient literally being drowned in his own life's blood.

At one time in the past a belief was current that in some instances pulmonary tuberculosis developed in the sequence of hemorrhage from the lungs. It required the elucidation of the etiology of tuberculous processes in general to finally demonstrate the fallacy of this view. Now, it is universally admitted that in such cases the pulmonary lesion was primary, not attracting attention until the occurrence of the hemorrhage.

BÄUMLER (*Deutsche medicin. Wochenschr.*, 1893, No. 1, p. 1) calls attention to a form of broncho-pneumonia that may occur in cases of pulmonary tuberculosis from the inspiration of blood and the contents of pulmonary cavities (including pyogenic cocci and tubercle-bacilli), in conjunction with hemoptysis. A similar condition may arise in the absence of hemorrhage, or in connection with an ordinary bronchiectatic cavity, but under these circumstances the course of the case is generally much less unfavorable.

The tuberculous inspiration-broncho-pneumonia may occur in cases in which a pulmonary lesion is not even suspected, or in which a tuberculous lesion has undergone retrogressive change. It is usually preceded by some form of active physical effort, and commonly pursues a rapid course, presenting the characters of an acute infectious disease, and leading to a fatal termination. The first manifestation is usually hemoptysis, which may persist in moderate degree for a number of days. The febrile movement is decided, and the temperature usually reaches a considerable height. Dyspnea is marked, and cyanosis becomes pronounced. On physical examination the signs of a diffuse broncho-pneumonia will be found. Careful examination of the sputum will detect tubercle-bacilli. After death a tuberculous cavity, containing a ruptured blood-vessel, will be found in one or in both lungs, and, besides, a lobular pneumonia; miliary tubercles may also be present, but not as a rule in any considerable number.

The clinical picture differs from that of enteric fever in the abruptness of onset, in the rapidity of course, in the period at which the pulmonary symptoms appear, and in the occurrence of hemoptysis. A knowledge of the previous history is important. Tuberculous inspiration-broncho-pneumonia sets in more abruptly than acute miliary tuberculosis; pursues a more rapid course; is attended with a higher febrile movement; cyanosis appears earlier; and the physical signs are distinctive. From ordinary broncho-pneumonia the tuberculous variety differs in the occurrence of hemoptysis and in the presence of tubercle-bacilli in the sputum.

The prognosis is always dubious, and as a rule unfavorable.

The treatment is purely prophylactic. Patients with pulmonary cavities, and with tubercle-bacilli in the sputum, should be cautioned against indulging in too active physical exercise; and as the existence of cavitation is not always demonstrable, great circumspection should be used in advising pulmonary gymnastics. These patients should avoid irritating atmospheres. When a tendency to hemoptysis manifests itself, they should be enjoined to observe the most perfect rest.

EDITORIAL COMMENTS.

Mixed Tuberculous and Typhoid Infection.—It is a well-known clinical fact that the differentiation of typhoid fever and tuberculosis (particularly of the acute variety) is sometimes exceedingly difficult; and that in a given case, in which the symptoms and physical signs of tuberculous disease become perfectly clear after an attack of what was supposed to have been typhoid fever, it may be impossible to say positively whether the febrile affection acted merely as a predisposing factor in the development of the secondary condition or the original primary disease was really tuberculous.

As an illustration of the difficulties of diagnosis, a case recently reported by Senator (*Charité Annalen*, 1892, xvii, p. 372; *Schmidt's Jahrb.*, 1892, No. 1, p. 29) is most interesting. A man, twenty-one years old, without hereditary predisposition, for a week presented

pulmonary symptoms and moderate fever; and for the next four weeks a continuous febrile movement, together with pain in the right iliac region and gurgling, rose-spots, enlargement of the spleen, liquid stools, and diazo-reaction of the urine. Examinations failed to disclose the presence of either tubercle-bacilli or typhoid-bacilli. The diagnosis lay between enteric fever and miliary tuberculous, and finally both were suspected. Death took place after an illness of five weeks. At the post-mortem examination the lesions of pulmonary and intestinal tuberculosis were found.

Cases are not wanting in which typhoid fever has occurred in a tuberculous patient, but the records are scanty (if any at all exist) of cases in which the simultaneous existence of the dual infection has been demonstrated. Without giving the clinical history, Kiener and Viellard (*Compt.-rend. hebdom. des Séances de Soc. Biologie*, 9. sér., tome v, No. 1, p. 14) report such a case that terminated fatally. At the post-mortem examination the lesions of an acute, disseminated, granular tuberculosis were found in lung, pleura, peritoneum, and pia mater. The lower third of the ileum presented the typical ulceration of third week of typhoid fever, while higher up in the bowel were the granulations of the tuberculous process. Bacteriologic examination of material obtained by puncture of the spleen disclosed the presence of bacilli that correspond in all particulars with typhoid-bacilli.

No Code.—The New York State Medical Society has adopted the following resolutions:

"*Resolved*, That the Society reserves to itself the right to punish its members for any unprofessional conduct.

"The determination of what shall be considered unprofessional conduct shall rest with the Society. If at any time charges are preferred against a member of the Society, these charges are referred to a committee which already exists for a similar purpose. This rule shall take the place of paragraph eight of chapter six of the by-laws, as well as the rules adopted by this Society in February, 1882.

"*Resolved*, That the Society deems it unwise, at this time, to appoint any committee of conference with the American Medical Association upon the subject of medical ethics, as requested by that distinguished body; but the Society ventures to express the hope that the American Medical Association, at no distant day, will take such action as will remove the merely technical obstacle to the most cordial coöperation between the two societies."

Whether or not this action be politic and judicious and ethical remains to be tested by the logic of events. It is a sort of *j'y suis, j'y reste* argument, about which the logic of controversy is of little use. There has certainly been too much controversy already. Let us quit arguing and try to unite in harmony. It is certainly a fact of profound significance for the American medical profession, and one that it behooves us all to consider most carefully and seriously.

The Physician and the Sectarian.—In a most intelligent paper recently read before the Homeopathic Medical Society of the State of Pennsylvania, Dr. Clarence Bartlett (*Hahnemannian Monthly; The Clinical Reporter*, vi, i, p. 20) recommends, in the treatment of the conditions that predispose to the occurrence of apoplexy, glonoin (nitro-glycerin), arsenic, arsenic iod., phosphorus, belladonna, and nux vomica. These, together with "abstinence from meat-diet and alcoholic beverages, moderate indulgence in eating, a quiet life, the free drinking of water, the avoidance of exciting emotions," are considered "simply indispensable." "When collapse is not present, the application of ice to the head has a beneficial effect, as it serves to excite contraction of the cerebral vessels. When collapse is present, mustard plasters to the nape of the neck have been recommended by Gowers as of value in inducing reflex contraction of the arteries." In the apoplectic attack, aconite, glonoin, opium, and other remedies are recommended to meet various indications. Now, had the article from which we quote appeared in any other than a self-styled homeopathic journal, it would scarcely have been possible to have discerned that the writer was a so-called homeopath. The various measures recommended are those that are practically employed by all honest physicians. The question of homeopathy, the question of dogma, does not arise. The fact is that the true physician will use any remedy, whatever its source, whatever its mode of action, that will alleviate suffering or cure the disease; it matters not whether the use be designated allopathic, homeopathic, eclectic, or what not. It is a cause for sincere regret that any body of men will permit their sphere of usefulness to be restricted by blind adherence to a dogma or will be parties to at least tacit deception by its pretended acceptance.

Carbolic Acid as an Antiseptic.—The swing of the pendulum is bringing antiseptic surgeons back to the point from which they set out. With the knowledge that wound-complications were almost invariably dependent upon contamination by living matter, efforts were directed to the finding of a body capable of preventing such contamination, without at the same time causing injury. Of all the antiseptics proposed or used, carbolic acid and mercuric chlorid are the two that have shown themselves most deserving of confidence, and the second has been much more largely used than the first. Recent developments have, however, tended to demonstrate that mercuric chlorid is not the perfect antiseptic that is has measurably enjoyed the distinction of being; and now comes the interesting announcement that Sir Joseph Lister (*British Medical Journal*, No. 1674, p. 163) has practically repudiated mercurial solutions for antiseptic purposes in surgical procedures, and has returned to the use of carbolic acid, which, in the strength (1:20) in which it is ordinarily employed, he shows to be germicidal to most of the noxious organisms.

A Lay View of Dispensary-abuses.—The general public, according to the New York newspapers, is awakening to the fact that the medical treatment of 300,000 or more people in one city by charity in the year 1890 is a fact worth considering. One writer takes the curbstone view of the question, and with surprisingly poor but popular logic, he argues that if the doctors are willing to pauperize themselves and degrade their profession, what is that to the public? Let the public most cunningly take all it can get without pay and without thanks. Whether to get clinical material or to beat rivals in the statistical showings, or from whatsoever motive, matters not. The indiscriminately free dispensary, it is moreover averred, is also justified by the fact that the out-and-out quack

is thus headed off. This is regardless of the fact that the quack were better beaten by public laws that the public will not allow to be passed, and also that the more preposterous the dispensary-abuse, the more outrageous the quackery rampancy.

Popularization of Medical and Hygienic Knowledge. — When one considers that quackery and impostures of all kinds, together with the diseases on which they thrive, are most luxuriantly manured by popular ignorance of physiology, hygiene, and medicine, the true physician must sympathize with every sincere attempt to enlighten the people in regard to these matters. In this connection we wish to direct attention to the work being done by Dr. Remondino in *The National Popular Review*, the specific scope of which is the field of preventive medicine and popular hygiene. Every month this tasteful and tactful periodical contains excellent articles designed to clarify the minds of its readers as regards sanitation, sound principles of dress, personal and communal hygiene, and especially with enlightened views as to the true aim and practice of the physician. As a plebificator of scientific medicine it is unrivaled.

Dr. Billings's Estimate of the Medical Profession as a Calling.—Every physician who loves his profession will be delighted to read the manly and sympathetic plea for it made by Dr. Billings in the last number of *The Forum*. Medicine does not bring the fame and money that may be gained in other callings, but it unites the intellectual, the moral, and the practical exercises of the mind in a happy and satisfying manner equalled by none other. Other motives than those of the love of humanity, of science, and of self-respect are often enough those of the medical student and practising physician—it does not need Philistinic criticism to tell us that—but in other professions the other motives and the Philistine himself are more at home than in ours.

The Sneak Advertiser, according to the resolution of the San Francisco County Medical Society, is not a person wholly above suspicion. He is to be expelled, if his name "appear in the daily press describing his professional powers in an unprofessional manner and he cannot give a satisfactory explanation" of the fact. That the wicked reporter or injudicious assistant was not allowed to be put into service as a scapegoat is shown by the Society's action in expelling four such offending members. There is evidently an end and even a reversal of the (untrue) dictum that "Manners and morals grow uniformly worse as one proceeds Westward."

Publication of Papers Read at the Pan-American Medical Congress.—Physicians are often prevented from giving their best literary work to societies, associations, and congresses because of the rule that papers contributed may not be published elsewhere than in the Transactions or special Journal of the society. This rule often works to the injury of the society and of the contributor. We are glad to learn that papers read at the Pan-American Congress may, after the meeting, be published in full in whatever journal the author pleases.

The Excelsior College of Medicine, a bogus institution, driven out of Massachusetts, has come to grief in New York, where its proprietor, a "Doctor" Booth, sold a *Herald* reporter a diploma for $50, and was the next day put in jail. If the *Herald* could secure them, and would devote an equal amount of space to publishing the examination-papers of some of the "legitimate" M.D.'s of some of the "reputable" medical colleges, it would do a still greater service to the community, and to medicine.

SOCIETY PROCEEDINGS.

THE NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, held at the New York Academy of Medicine, February 7, 1893.

DR. ALFERD WIENER presented a "Subacute Case of Unilateral Bulbar Palsy." The patient was a young man of seventeen years. The family history was negative. Nearly two years previously the glands on both sides of the neck, in the region of the sterno-cleido-mastoid muscles, began to enlarge. More than a year later one of these glands on the right side suppurated, and the pus was evacuated. Soon after this, the remaining glands began to give rise to so much discomfort that those on the right side were removed, together with a large portion of the sterno-cleido-mastoid muscle. A little later the glands on the left side were removed. Examined microscopically, the glands proved to be tuberculous. After two months more it was noticed that the patient's tongue, on protrusion, deviated to the right side; this was followed by hoarseness and difficulty in swallowing, and later on by distinct atrophy of the middle half of the tongue. On electric and laryngoscopic examination it was found that there was complete right-sided palsy, involving the tongue, soft palate, pharynx and larynx, together with paralysis of the sterno-cleido-mastoid and upper portion of the trapezius muscles. The lesion in this case, it was pointed out, might be situated at a point just external to the exit from the skull of the pneumogastric and spinal accessory nerves, namely, just behind the angle of the jaw; or on the surface of the medulla; or it might be nuclear. All the facts in this case lend support to the view that the lesion is a tuberculous one, involving the nuclei of the nerves that govern the palsied parts. These groups of cells form the conjoined nuclei of the spinal accessory, vagus, and hypoglossal nerves, and a very localized lesion in this part of the medulla would be sufficient to affect them. The involvement of the trapezius and sterno-mastoid muscles is probably due to injury to the nerve supplying them, while the laryngeal symptoms may be accounted for by a paralysis of the stylo-hyoid muscle (due to pressure from an enlarged gland) or by the unantagonized action of the muscles on the left side of the throat.

DR. GEORGE W. JACOBY presented a case of "Complete Atrophy of the Tongue with other Nuclear Symptoms." The patient was a female, thirty years old, whose mother had died of pulmonary tuberculosis. Her husband's sister had more recently died of the same affection, and had been nursed by the patient. For two months there had been gradual impairment of vision, which was found to be due to a slight atrophy of both optic nerves, and under internal treatment disappeared. The patient had also suffered from violent headaches, which disappeared

with the loss of sight. For three weeks there had been difficulty in swallowing and speaking. Vomiting occurred every morning on rising. At the first examination the tongue deviated to the left and there was marked atrophy of its right half. The uvula was deflected to the left, and there was paralysis of the left side of the soft palate. The patient had enlarged cervical glands. At a later date the atrophy of the tongue and soft palate became complete. Paralysis of the internal and external ocular muscles of the left side also developed. The case was thought to be one of progressive nuclear paralysis.

DR. B. SACHS stated that in Dr. Wiener's case a chronic nuclear condition must be excluded on account of the rapid progress of the symptoms, and because they had remained strictly unilateral. In Dr. Jacoby's case an element of doubt enters into the diagnosis, because of the rapid progress of the symptoms. They seemed to indicate the presence of some active lesion, specific or tuberculous.

DR. THEO. H. KELLOGG read a paper on "Modifications of Respiration in the Insane." To facilitate the study of these modifications, he grouped them as follows: A. Modifications of respiration as regards frequency, depth, rhythm, and sound. B. (1) Spasmodic expiratory modifications, such as occur in laughter, crying, sneezing, coughing, and snoring. (2) Spasmodic inspiratory modifications, as in singultus, chasmus, and laryngeal crises. C. Dyspneic modifications.

DR. C. A. HERTER made a report of a case of "Sarcoma of the Cervical Spinal Cord. Autopsy." The patient was a merchant, twenty-nine years old, who had noticed a loss of sensation, beginning as numbness, on the ulnar side of the little finger of the right hand. Soon the entire little finger was involved, and later the ring finger and the ulnar side of the middle finger. At the same time the anesthesia extended upward along the hand. In the course of three months the anesthesia had passed up the ulnar side of the forearm and arm, and had reached outward over the hand as far as the thumb. Pain also appeared on the ulnar side of the right forearm and hand; slight and occasional at first, later severe and of increased duration. This was followed by loss of power, first in the flexors of the fingers, then in those of the forearm. About five months after the first symptoms were noted, there developed atrophy of the first dorsal interosseous muscle. The wasting soon involved the muscles of the thumb and hypothenar eminence, and the flexors of the forearm. In about the eighth month the pain abated greatly. During the period of severest pain, the entire right arm became edematous. On electric examination made thirteen months after the appearance of the first symptoms, loss of faradic irritability in the right arm, and in all the extensors and flexors of the wrist and interossei, was found. Tactile sensation and the pain-sense were entirely lost along the ulnar border of the arm to the axilla, and were greatly impaired along the radial border as high as the shoulder. The temperature-sense (which was only roughly tested) appeared to be quite lost in the arm. There was almost an entire loss of the muscle-sense; the patient had no sense whatever of the position of the fingers, hand, and arm. The surface of the right arm was pale and much colder than that of the left. In the left hand and arm, power and sensation were apparently normal. Both legs were a little weak. Equilibrium was maintained without difficulty. The knee-jerks were exaggerated, in the greater degree on the right side. The power of the sphincters was unimpaired. There was no vertebral deformity, and no tenderness on pressure over any of the cervical or upper dorsal spines. Sight was unimpaired. The pupils reacted normally to light, and in accommodation. The right palpebral fissure was distinctly smaller than the left, and the right lid drooped a little. On examination of the chest there was found dulness on percussion over the upper part of the right side. The temperature was 101°; pulse, 100; respiration about 30 per minute. In the course of two weeks after this examination, the right leg became much weaker than it had been, and pain and numbness extended gradually down the entire left arm. Loss of power was also detected in the left leg. There was temporary retention of urine. In the course of a month a tense swelling was observed over the outer extremity of the right clavicle, and extending down into the axilla over the front of the shoulder. In the course of two weeks this tumor grew to the size of a child's head, became very tense, and was covered with greatly distended veins. The patient grew rapidly worse. Incontinence of urine and feces set in, and the breathing became labored, owing to paralysis of the thoracic muscles. There was total loss of sensibility extending as high as the crest of the ilium upon both sides, with bilateral impairment of sensibility as high as the third rib. Large bedsores appeared, and, sixteen months after the first symptoms, the patient died from exhaustion and respiratory failure.

A partial autopsy was made, and a mass removed from the clavicle, and another from the upper and posterior part of the thoracic wall. A number of tumors occupied the posterior and inner aspects of the right upper chest, displacing the lung. Some of these masses appeared to grow from the clavicle, others from the vertebræ, but their relations could not be distinctly made out. The specimen obtained from the spinal cord was five inches long, and extended from the eighth cervical to the seventh dorsal segment, both inclusive. Sections were made from the eighth cervical, and first, second, and third dorsal segments. The tumor involved at this level nearly the entire right half of the cord, and encroached anteriorly upon the left anterior column of the cord. Posteriorly, it did not pass quite to the posterior horn. The ganglion-cells in the region of the tumor had undergone partial or entire destruction, or were in some instances apparently replaced by small groups of spindle-shaped connective-tissue cells. In structure, the tumor was an exceedingly vascular spindle-celled sarcoma. Sections made from the mass, from the clavicle and thoracic wall, showed it to be a fibro-sarcoma.

While the anatomic diagnosis presented no difficulties, the pathologic diagnosis was made with some hesitation. The existence of signs of pulmonary consolidation, muco-purulent expectoration, hectic temperature, rather rapid emaciation and night-sweats, all suggested a tuberculous process, and the diagnosis of a secondary tuberculous tumor of the cord was thought to be justified. The alternative diagnosis was sarcoma, but the accuracy of this appeared improbable. An examina-

tion of the sputum was not made. Dr. Herter had collected twenty-six cases of sarcoma of the spinal cord, which he had compared with cases of massive tubercle of the cord. This study had shown that (1) Sarcoma of the spinal cord occurs with about equal frequency in the two sexes. (2) Sarcoma of the spinal cord is essentially a disease of adult life; massive tubercle, on the contrary, is a disease of adolescent and early adult life. (3) Etiologic factors in the development of sarcoma of the spinal cord are practically unknown. (4) In three cases of sarcoma, the first symptoms appeared during pregnancy. (5) Pain appears to be the earliest and most prominent symptom in four-fifths of the cases of sarcoma of the cord. (6) In sarcoma, the course of the disease is, in general, much slower than in tubercle.

THE PRESIDENT said that while sarcoma in general is more commonly met with in persons under the age of thirty, sarcoma in the nervous system is decidedly more frequent in adult life. He has recently collected 600 cases of tumor of the brain (300 in adults and 300 in children), and among these there were 34 cases of sarcoma in children, and 157 in adults. He was much interested in the collection of cases made by Dr. Herter, and thought it would be well to carry the investigations further and determine how many of these cases would have been suitable for operative interference.

DR. GRAEME M. HAMMOND expressed the opinion that the symptoms referred to the side of the body opposite to that invaded by the growth, might have been due to degenerative changes in the opposite side of the cord, caused by a cutting off of the blood-supply, or the commissural fibers may have been interfered with sufficiently to produce the symptoms.

DR. HERTER added that the case was seen by him at too late a day to be operated on.

DR. GEORGE W. JACOBY read a paper on "The Motor Disturbances of the Heart of Nervous Origin." He stated that in a large number (probably in more than one-half) of the persons who seek advice on account of some motor disorder of the heart, no anatomic lesion is clinically discoverable, and no mechanical cause can be found. In such cases it is reasonable to seek for the cause of the altered function in some disorder of the complicated nervous apparatus of the heart. The action of the heart may be intermittent, irregular, abnormally slow (bradycardia), or abnormally frequent (tachycardia).

Intermittency may be true or false; in the latter form the pulse fails, but the heart is regular, while in the former the heart actually drops a beat. In irregularity of the heart's action the number of pulsations varies from minute to minute, or the pulsations vary in height and tension. These forms of arhythmia may be persistent or only temporary: when persistent, they are probably due to some organic disease of the heart; when they are temporary, they are either dependent upon defective constitution of the blood, or are purely neurotic. Toxic influences associated with sexual excesses, and with the excessive use of tea, coffee, tobacco, and alcohol, are potent factors in the production of arhythmia. Intermittency may be due to even the moderate use of alcohol.

Slow pulse, or bradycardia, is a term applied to cases in which the pulse falls, according to some authorities, below 60 per minute, or according to other writers, below 40. Slow pulse should be regarded as a symptom only. It may be due to a variety of causes. Bradycardia should be limited to such cases in which the infrequency of the pulse is due to a disorder of innervation. A slight reduction in the frequency of the pulse is common in disturbances of the digestive tract.

In paroxymal tachycardia the attack is always sudden in onset, and usually unexpected. The pulse is increased from normal to from 180 to 240 per minute, or even to 300 per minute, according to some observers. There is no disturbance of rhythm and no intermittence. The heart beats in a strong and energetic manner, and in direct contrast to its action is the extreme diminution of arterial tension. The cessation of the attack is as sudden as its onset. The paroxysms vary in duration from a few minutes to several hours, and occasionally last even for days. The intervals between the attacks are irregular. During an attack the excretion of urine is generally diminished; it may be followed by the passage of a large quantity of clear, limpid urine. The etiology of these cases is obscure. Psychic influences, fright, errors of diet, bodily exertion, have all been assigned as causes. Tachycardia is an affection of adult life, and the best established causes are bodily and cerebral overwork. In these cases it seems probable that the condition is a bulbar neurosis.

DR. J. W. BRANNAN said that some years ago, when he made a study of the pathology of tachycardia, he was inclined to believe that the condition was due to a bulbar neurosis, but he afterward rather favored the suggestion that the cause of the trouble was to be found in the heart-muscle. Up to four years ago, only four autopsies were recorded, and in all of these the nervous system was found intact; in only two was the heart-muscle examined, and in both cases an extensive development of fibrous tissue was found in the wall of the left ventricle. This may have been due to the rapid action of the heart. In another case, in which the disease had existed for only three months, there was an extensive development of fibrous tissue throughout the wall of the left ventricle, in the trabeculæ, and the papillary muscles. The only objection to this theory lies in the fact that there are so many cases of myocarditis without any history of tachycardia. This has been accounted for by the explanation that certain portions of the heart-muscle are tolerant, while other portions are intolerant, and involvement of the latter gives rise to tachycardia. The intolerant regions are especially found in the inter-ventricular wall and the papillary muscles.

DR. HERTER referred to a case of paroxysmal tachycardia in a man who is a sexual neurasthenic, and suffers from intestinal indigestion. Each attack lasts four or five hours, and is generally induced by some indiscretion in diet. The urine passed after such an attack contains in large amount the products of intestinal putrefaction. It is an interesting question whether the attacks are due to these poisonous substances, or perhaps to mechanical causes—such as distention of the colon, or other parts of the intestinal tract.

Susceptibility to Homatropine.—A correspondent writes us concerning a case almost identical with that published in THE NEWS, January 21, p. 78.

NEWS ITEMS.

Hardy, the distinguished French dermatologist, died recently.

The New York Therapeutic Review is the name of a new quarterly edited by Dr. Paul Gibier, who will be supported by a notable list of collaborators.

The Philadelphia Neurological Society.—A stated meeting will be held February 27, 1893, at 8.15 P.M. Dr. C. L. Dana, of New York, will read, by invitation, a paper entitled "Some Studies of the Nature and Symptoms of Shaking Palsy, with the Report of an Autopsy."

The Eleventh International Congress of Medicine will be inaugurated in Rome on the 24th of September, 1893, and will close on the 1st of October.

Any physician may become an active member of the Congress by fulfilling the conditions of membership, inscribing his name, and securing his admission ticket.

Scientists of other professions, who, through their special studies, are interested in the labors of the Congress, may acquire the rights and assume the duties of active members, and participate in the work of the Congress, both by communications and discussions.

The fee for admission to the Congress is twenty-five francs, or five dollars.[1] It entitles to a copy of the *Transactions* of the Congress, which will be forwarded to the members immediately after publication.

The character of the Congress is strictly and exclusively scientific.

The work of the Congress will be divided amongst nineteen sections; every member is requested to indicate, on paying his admission fee, the section in which he desires to be inscribed.

The provisional committee will arrange the appointment, in the opening session, of the permanent officers. They will be a president, three vice-presidents, a number of honorary presidents and secretaries. Each section will elect, at its first meeting, its president and a certain number of honorary presidents, who shall alternately take the chair during the session. Some of the secretaries will be chosen from among the foreign members, in order to facilitate the recording both of communications and of discussions in the different languages.

There will be daily sessions, either general or sectional. The times and number of the general sessions, and the business to be transacted in them will be arranged by the President of the Congress.

The general sessions are reserved for (*a*) the consideration of the common work of the Congress and of its common interests, (*b*) addresses and communications of general interest and importance.

The addresses in the general sessions, and in such extraordinary sessions as may be arranged, will be delivered by members chosen by the committee for the purpose.

Papers for and communications to the Congress must be announced on or before June 30, 1893. A brief abstract of every paper and communication, with their conclusions, must be sent to the committee on or before July 31st. All of them will be printed and distributed to the members, by authority of the President. Such as arrive after that date cannot be expected to find a place on the regular order of business, and will be accepted only if time will permit.

The business of the sections will be arranged by their presidents, who will also determine the hours of meeting, avoiding those reserved for the general sessions. Two or more sections may hold joint meetings with the consent of their presidents. There will be no vote on scientific questions.

Fifteen minutes are allowed for the reading of a paper or communication. In the discussion every speaker can have the floor but once, and for five minutes only. To close the discussion the author of the paper is allowed ten minutes. Additional time may be given him by the president, by special resolution of the section, if the importance of the subject under discussion appear to require it.

The manuscript of all addresses, papers, and communications read either before a general session or a section must be handed to the secretary before the close of the meeting. A special committee on publication, appointed by the president, will decide which or what part of them shall be published in the *Transactions* of the Congress. Such members as participated in the discussions are required to hand to the secretaries their remarks, in writing.

The official languages of the session are Italian, French, English and German. The regulations, programs and daily bulletins will be published in these four languages. During the meetings, however, a member may be permitted to use, for a brief remark, any other language, provided some member present expresses his willingness to translate such remarks into any of the official languages.

The president directs the discussion according to the parliamentary rules generally obeyed in similar assemblies.

Persons not classified under Article 3, who are interested in the labors of a special section, may be admitted by the President of the Congress. They will receive a special ticket on paying their admission fee; will not be entitled to a copy of the *Transactions*, and cannot speak in the general sessions or in any section other than that for which they were inscribed.

The President may invite or admit students of medicine to attend and to listen. They will be given a special admission ticket, free of charge.

Arrangements have been made with the different Italian and foreign railway and navigation companies, in pursuance whereof special reduced prices have been granted on the steamers and railways of the countries which the members of the Congress are to traverse.

On the occasion of the Eleventh International Medical Congress, an Exhibition of Medicine and Hygiene will be inaugurated in Rome, which will gather all that may practically interest physicians and specialists.

[1] Money order or check to the treasurer, Professor Comm. L. Pagliani, Rome, Italy. Dr. A. Jacobi, Chairman of the American National Committee, 110 West 34th Street, New York, has volunteered to forward applications and fees.